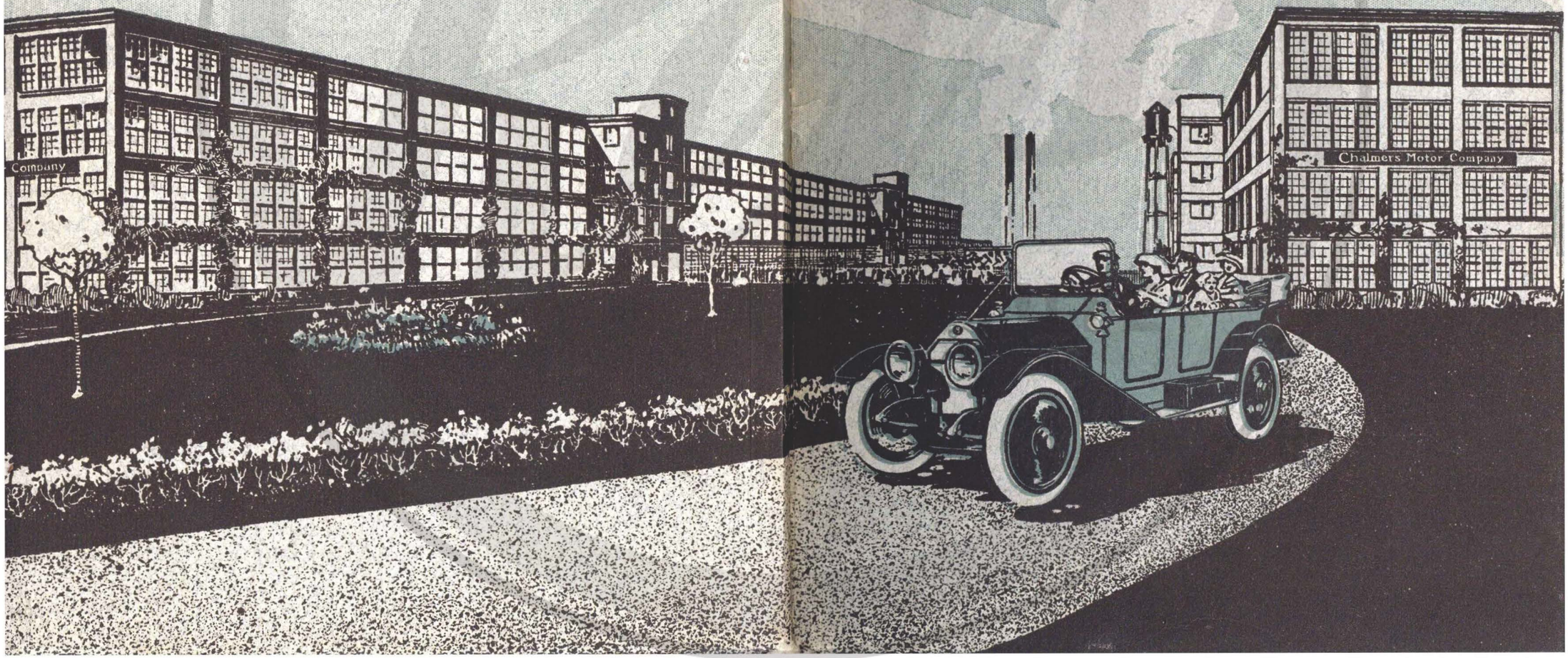
Story of The Chalmers Car

CHALMERS · MOTOR · CO.
Detroit, Mich. U.S.A.

This monogram on the radiator stands for all you can ask in a motor car



THIS booklet tells the story of the making of the Chalmers car. It describes all of the important operations, from the engineer's designing board all the way through to the shipping platform.

Chalmers motor cars are manufactured by the Chalmers Motor Company in the Chalmers shops at Detroit, Michigan.

The Chalmers plant comprises sixteen buildings laid out over a 30 acre site.

These buildings contain 1,000,000 square feet of manufacturing floor space.

Employed in this factory are 4,000 men engaged in the work of designing, building and testing Chalmers cars.

The investment of the Chalmers Motor Company in this plant is $6,000,000.

This investment stands for permanency; for right methods of making and marketing cars; for quality; and especially, for the economy and efficiency of manufacturing which enables the company to build strictly high grade automobiles to sell at medium prices.

That the Chalmers Motor Company does build cars of highest quality to sell for medium prices is a fact. This book explains *why* the Chalmers Company *can* accomplish this result and just *how* it *does* accomplish it.

This monogram on the radiator stands for all you can ask in a motor car

Story of the Chalmers Car

Being a description of how Chalmers motor cars are built in the shops of the Chalmers Motor Company at Detroit, Michigan.

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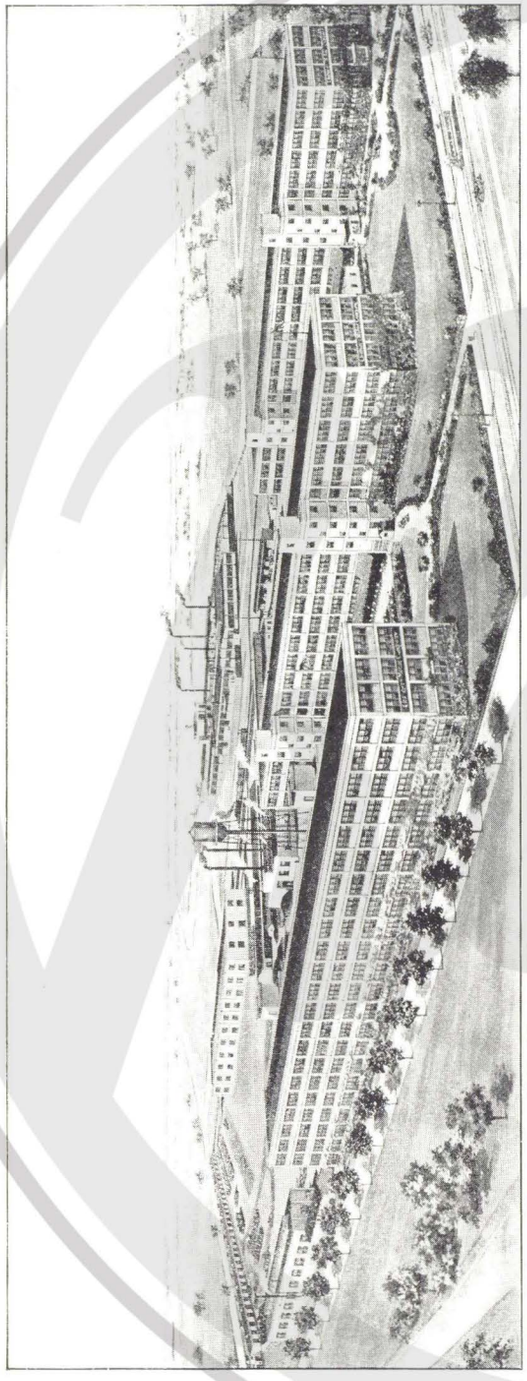
DETROIT



The Chalmers plant consists of 16 buildings, which occupy a site of 30 acres. The three main buildings are each 60x400 feet and four stories in height. As this book goes to press work is beginning on another four-story building. The factory has a total of more than 1,000,000 square feet of manufacturing floor space.

By Way of Explanation

A MOTOR car is the most wonderful machine man has built for his personal use. As finely constructed and as perfectly balanced as a fine watch, it is still sturdy enough to carry heavy loads and to endure tens of thousands of miles of travel over all kinds and conditions of roads.

The automobile is man's most faithful mechanical servant. Properly cared for, it will give an as yet undetermined amount of work. It is ready to go when the master commands; it stops when he orders.

Unlike a locomotive, an automobile has no special requirements. It does not need a scientifically designed and expensively built right of way. Its fuel is easily carried and easily procurable. It does not require the constant attention of an expert mechanic or a professional engineer.

A motor car is as comfortable to ride in as the most luxurious brougham; yet it has the sturdiness of an ox-cart.

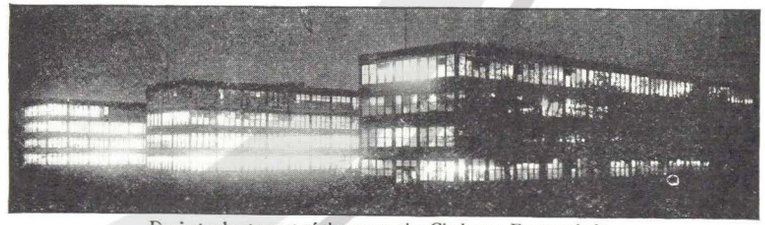
A motor car combines the best qualities of a horse-drawn vehicle and of a railway train, with the superiority over either that it will travel at slow or fast speed, over any kind of road, and carry its passengers comfortably.

Beyond all this, the motor car is one of the most wonderful things in the world because it utilizes more of the raw products and fundamental elements of Nature than nearly any other machine that man has created.

Into the motor car go Iron for the motor.

Steel for the gears, axles and other parts.

Brass for the motor parts and for the trimming.



During a large part of the year, the Chalmers Factory is in operation night as well as day.

Aluminum for the crank case and the transmission case.

Bronze for the motor parts and the carburetor.

Copper for the wiring.

Platinum for the magneto.

Nickel for the plating of various parts.

Wood for the wheels.

Leather for the upholstery.

Rubber for the tires.

Cotton for the tires and the upholstery.

Glass for the windshield.

Mica for the ignition parts.

Zinc for the battery.

Paper for the gaskets.

Hair for the upholstery.

Asbestos to protect the car from the heat of the motor.

Porcelain for the spark plugs.

Paint, with its basic pigments, its oils, turpentine, gums and other constituent parts.

Petroleum, which furnishes the driving force of a motor car.

Mineral Oils and Greases for lubricating purposes.

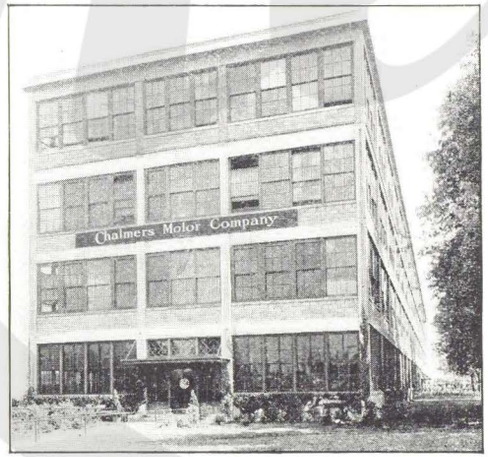
Electricity for lighting and for exploding the petroleum gas which operates the motor.

Water for cooling the motor.

Air for mixing with the fluid gasoline in carburation and for cooling purposes.

To the motor car, nature has contributed the best of her products; and out of these many basic parts man has built his most wonderful machine.

To utilize these many parts and to produce from them a co-ordinating mechanism which will do the things that are required of a motor car, has called into play



In this building are the general offices, the engineering department, service division and top department.

This entire building is devoted solely to the manufacture of front and rear axles.

the best inventive genius of the world; has developed new professions and new trades; has caused the invention of new and wonderful machines; has built up great manufacturing plants which are wonders of productive industry.

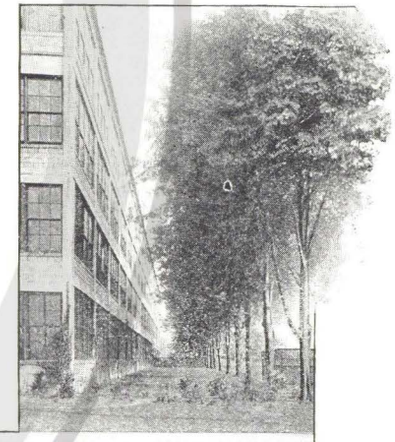
These are things which we all know in a general way, yet it takes a personal experience to force the real magnitude of the automobile industry home to an observer's mind. To the writer these hazy generalities became big, concrete facts only after a visit to one of the greatest automobile manufacturing plants in the country—that of the Chalmers Motor Company.

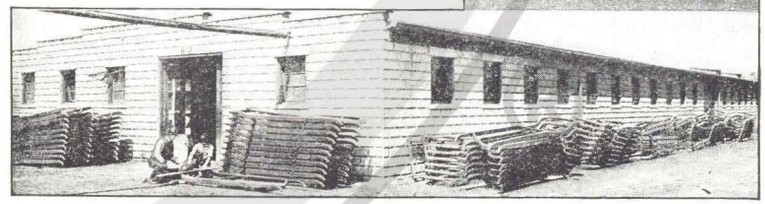
Detroit the Motor Center

In Detroit are built more motor cars than are produced by all of the other cities of the country combined. It is said that approximately one-fourth of the entire population of Detroit—the eighth city of the land—is concerned with the manufacture of motor cars and automobile accessories. Wherever one goes in Detroit, one sees motor cars and hears the names of motor cars. But no name is heard more frequently than Chalmers.

The plant of the Chalmers Motor Company is one of the features which is pointed out to sightseers in a city which entertains three-quarters of a million visitors a year.

For the Chalmers Motor Company has one of the most complete and most efficient automobile





The long row of trees which flanks the office building furnishes cooling shade to the workers on hot days—and a good appearance always. In the building shown below, all raw materials are received and inspected before they are accepted for Chalmers cars.

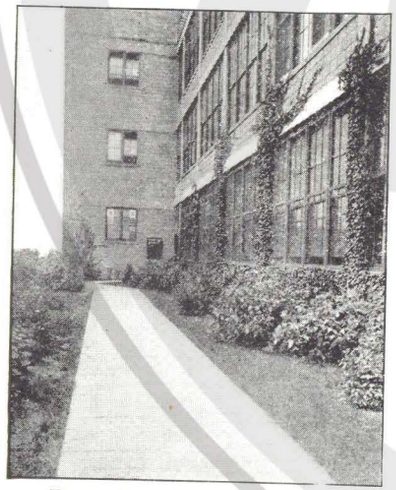
Wide lawns and flower beds give the factory a park-like setting.

plants in the country; a factory which is new and modern in every respect; which was built expressly for the manufacture of Chalmers cars; which represents an investment of $6,000,000, and in which are employed 4000 people.

Set in a Park

Approaching the Chalmers factory, one gets the impression, not of a manufacturing plant, but of a large public institution. There is none of the smoke and dirt which one generally associates with machinery manufacture. The three main buildings which face the street are plain and massive. Before them spreads several hundred feet of lawn, dotted here and there with flower beds and shrubbery. The whole effect is that of a well-kept park.

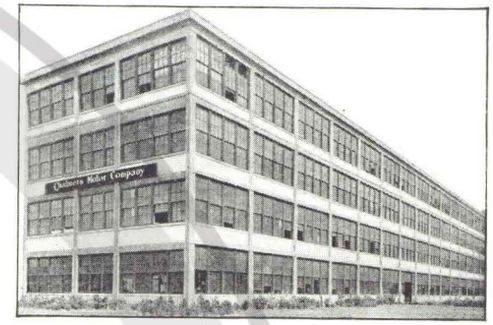
At first glance, the long buildings seem to be made almost entirely of glass, for each story is simply a long succession of windows. Between the buildings are broad open spaces. In looking at this great plant, one thinks instinctively; "Here is a pleasant place to work. Here are the working conditions which go with the most skillful production."



The shrubbery lined approach to the factory entrance.

In the center of the park, beside the first of the large buildings are some tennis courts. Under a long row of maple trees are park seats. At the noon hour young men play ball on the lawn beside the factory. And seeing all this one surmises that the 4000 Chalmers people take pride

in their company and are glad to do their work well.

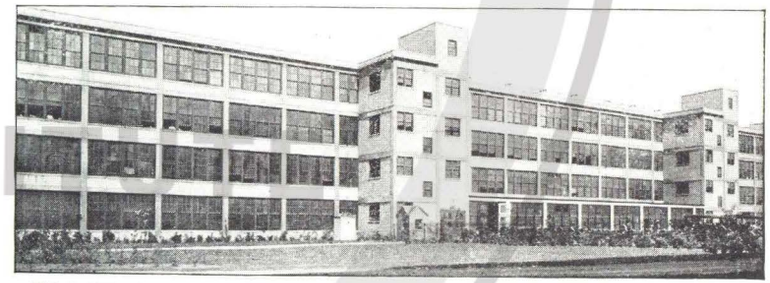


This building is the home of the chassis and wheel paint shops; the chassis and frame assembly; the body assembling department, and the stock rooms.

Back of this pleasing front of lawn and foliage and flowers, is the great humming factory where Chalmers cars are manufactured at the rate of forty a day. On all sides are motor cars in various stages of manufacture, and after one has walked several miles through the buildings and test yards, the first thought is one of amazement that there are so many motor cars in the world.

Here then is an automobile factory typifying the most advanced element of civilization—larger than many prosperous towns, employing 4000 workmen, and with at least 15,000 people dependent upon its production for their livelihood—a factory in which are built practically all of the thousands and thousands of parts which go into the production of Chalmers cars.

A visit to such a factory as this, more than any other experience one could have, forces home the realization of the wonder of the motor car and removes all doubt regarding the premise which opens this book—a motor car is the most wonderful piece of machinery man has built for his personal use.



This building houses more than a half-million dollars worth of the most modern machinery for making the parts for Chalmers cars.

The Chalmers engineering force is one of the largest and most efficient in the automobile industry. At its head is Geo. W. Dunham, one of the foremost designers of the country. Mr. Dunham is internationally known for his motor car creations. He has among his assistants some of the best men in the engineering profession.

The Designing of a Modern "Magic Carpet"

THE beginning of a motor car is simply an idea.

All other things being equal, it is the fundamental design—the idea back of the car; the "know how"—which determines the quality of a car.

The Chalmers Motor Company has a large staff of engineers, selected because of experience and proved ability. It is the business of these men to create and develop new ideas; to develop new principles and study old principles of automobile construction.

These men are pioneers. They have been developed by a new order of things. Automobile engineering is the modern branch of an old profession, and, because it is new, the work of the automobile engineers is to a large extent creative.

The men who design Chalmers cars, like all pioneers, try everything which is new and which seems good. Their experiments cover every phase of automobile building, and from the great mass of available materials they take only that which *proves best in actual trial.*

For, under the direction of this staff of engineers is a corps of expert draftsmen; as many highly skilled mechanics, and a force of chemists and analysts.

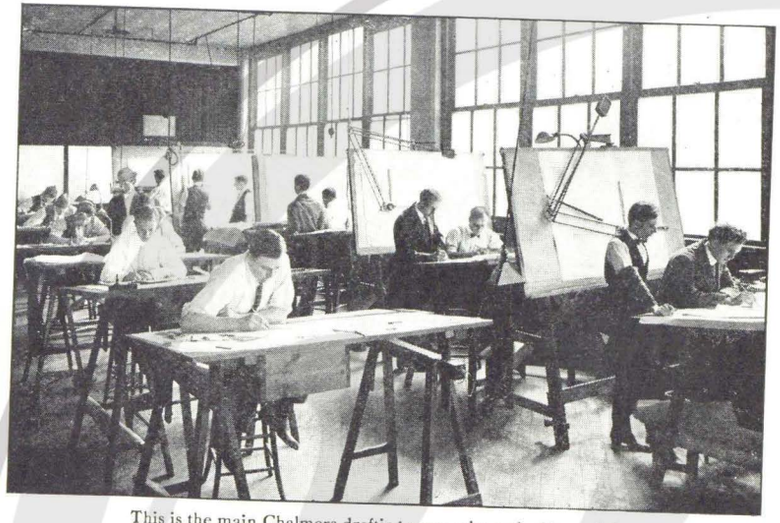
Each new idea developed by the Chalmers engineers is built into an experimental car. When a new Chalmers model is to be produced, experimental cars are kept on the road in all parts of the country—in the mountains of the East, in the heat and sands of the South, in the cold of the North,—for months before the factory is allowed to start the manufacturing processes. An engineer is always with the car. Under his critical eyes, every part from radiator to rear axle is put through the severest tests the roads provide.

The Chalmers is a proved car.

The Engineering Department of the Chalmers Motor Company costs a great sum each year. This sum is spent to make each new Chalmers model better than its predecessors; it is spent to give the purchaser of a Chalmers car higher dollar for dollar value; to give him more convenience, more power, more strength, more comfort, more beauty, in his car. It is spent to get in the design, and in the warp and woof of the modern "magic carpet"—a motor car—the best that money can buy.

It is this right design and this proving of every feature before it is incorporated in a car that is the owner's guarantee of satisfactory service. For if the first idea—the fundamental design—is not right, the finished car can never be right, no matter what material goes into it, no matter how painstakingly it is built.

Chalmers cars are right, first of all because they are rightly designed.



This is the main Chalmers drafting room where the ideas of the Chalmers engineers are put on paper.

The Dream with a Purpose

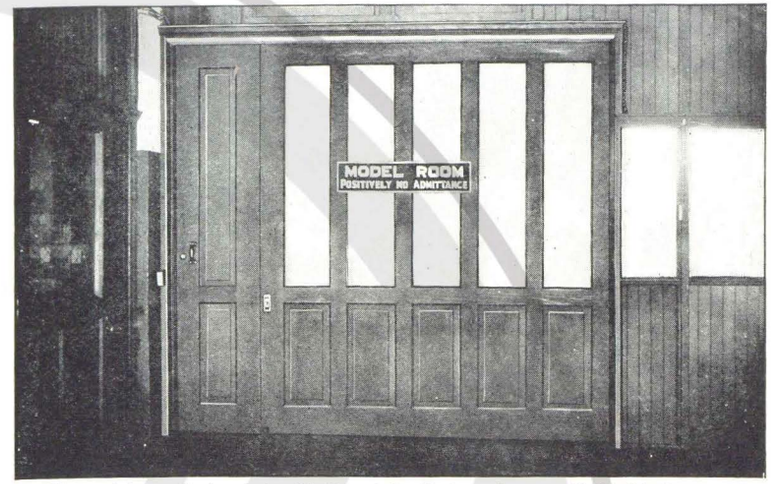
THE first idea back of a Chalmers car is just a dream, an ideal. These cars which are built in the imagination are the dreams of practical men; but it remains nevertheless for the actual building of experimental cars to show whether this particular dream or some other is the more practical.

From the minds of the engineers, the design of a Chalmers car is transferred to paper. In a room which is always locked and to which only the chief engineers are admitted, a corps of designing engineers have their drafting boards. In this room have been developed some of the most important inventions of the automobile industry.

From the sanctum of the designing engineers, the first drawings go to the main drafting room. Here, too, men work in secret.

From the drafting rooms, the original drawings go to the blue print room, where working blue prints are made for the first experimental cars.

Later, when the final design has been accepted by the engineering staff, this room produces the working blue prints for the entire factory, making an average of 100 blue prints an hour. Here, too, is kept a file of every blue print used in the Chalmers factory.



The model room is the holy of holies of the Chalmers factory. Only picked experts are employed here; only the engineers are admitted. Here all Chalmers experimental models are built.

The Dream Realized—and Shattered

BUT a car on paper is only a paper car after all. To build the ideas of the engineers into real automobiles and to test these experimental cars to the breaking point, is also the task of the engineering department.

A part of this division of the Chalmers organization is the model room. This is an automobile factory complete in itself. Here are employed mechanical engineers and the most expert workmen that can be secured. Here the dream of the engineers is realized in the form of experimental cars which are built up only to be tested and torn down again.

Everything new which seems good is tried out. Never less than three experimental cars are built for each new Chalmers model.

After these cars are ready for the road they are turned over to engineers who have instructions to find weak spots if possible. Each model is pounded over all sorts of roads for many thousands of miles.

Then the cars are brought back to the factory. In the model room they are again torn to pieces. If any part shows unusual wear, due to wrong design or weak construction, it is immediately corrected. With these alterations, a new car is built, and it is again sent out for the grueling test which shall prove whether or not it is worthy to be called a Chalmers.

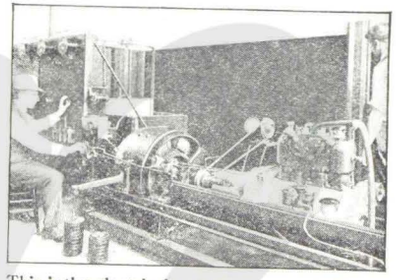
And finally, when every part has been proved up to the Chalmers standard and has received the O. K. of the engineers in charge, the experts of the model room build the final car which is the pattern for all other Chalmers cars of that type.

The Home of the Destroyer

APART from design, the materials which go into a car must be proved equal to the tasks they have to perform.

The one sure way to prove the endurance of any piece of material is to wear it out.

The Chalmers Physical Laboratory is the Home of the Destroyer. To the experts in this laboratory come all of the metals which are to be used in a car. Steels of different alloy, different kinds of iron, brass, bronze, aluminum, are here put on machines and crushed, twisted, bent or stretched until they break. Only such metals as show the greatest endurance are accepted for Chalmers cars.

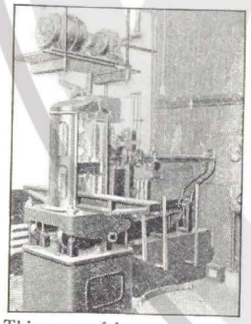


This is the electric dynamometer on which new motors are tested for power, endurance and economy.

In this laboratory, too, such parts as carburetors and magnetos, which are not built in the Chalmers factory, are tested to the limit of their efficiency. A dozen makes of magnetos, for instance, are run on a single shaft, each generating current just as it would in a motor. Started at the same time, these magnetos are run at high speed until only one survives.

It is truly a survival of the fittest, for only the fittest will be accepted for Chalmers cars.

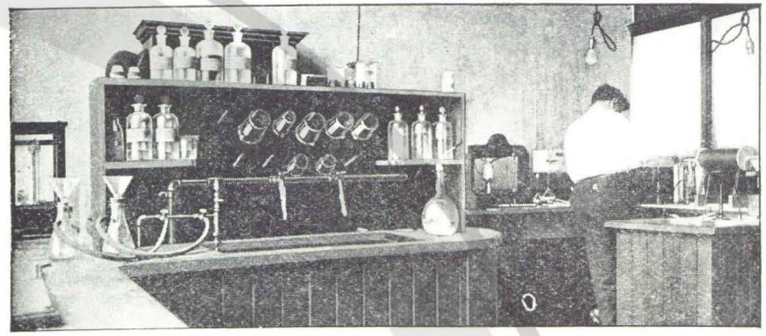
In one department of the physical laboratory, experimental motors are proved out for power and quietness, as well as wearing quality. Here they are run for hours on an electric dynamometer, while every feature of the performance is registered. Only a motor which is right can survive the test of the physical laboratory.



This powerful apparatus is a Reihle testing machine used for testing metals for tensile strength, torsion strains and so forth. It is one of the most thoroughly efficient testing devices built.

In the physical laboratory, the things which have been accepted as right by one group of men, all of them experts in their respective lines, are broken to pieces to prove how nearly they approach the standard which is the Chalmers standard.

This laboratory is equipped with every modern device for best accomplishing the work for which it is designed. The fine balances, wonderful test gauges, elaborate electrical apparatus and powerful machines look more like the laboratory of an engineering college than of a manufacturing plant.



All Chalmers materials are submitted to the tests of expert chemists. This picture shows one corner of the chemical laboratory.

The Acid Test

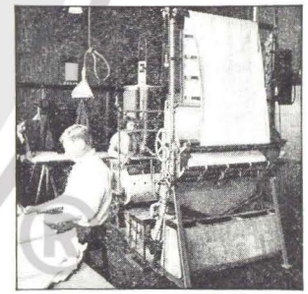
AN automobile is only as strong as its weakest part, and weaknesses, if they exist, are usually in materials.

Therefore, all of the materials which go into Chalmers cars are Chalmers-specification.

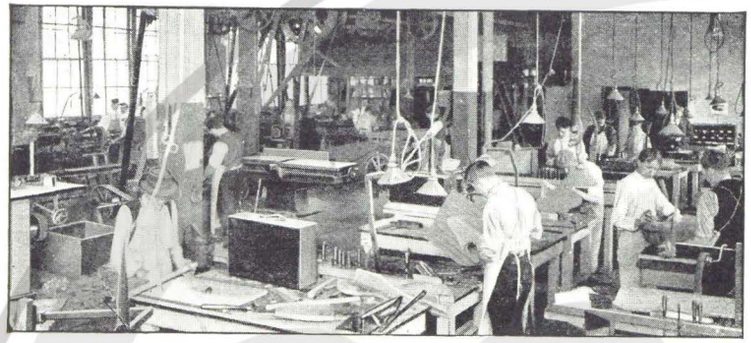
In a Chemical Laboratory which has every scientific device for analyzing materials, and which is in charge of analytical chemists, all of the raw materials which go into Chalmers cars are tested to determine the genuineness of their composition.

There is not a shipment of steel or iron or bronze or aluminum or brass which comes into the Chalmers factory that is not submitted to the acid test of the chemical laboratory. It is through the work of the chemist that the Chalmers engineers determine the exact composition of the materials which shall go into Chalmers cars; and it is the chemical test which checks all of the materials purchased subsequently, to make sure that they come up to the Chalmers standard.

In connection with the chemical laboratory, the Chalmers Engineering Department keeps a file in which is recorded the result of every laboratory test. This is a check on the producers of raw materials, and by means of this file the chance of fluctuation or depreciation in material is reduced to the minimum. Once the Chalmers standard has been determined by the Engineering Department, it is rigidly maintained by these elaborate tests.



This blue print machine prints, fixes and dries 100 blue prints an hour for use in the Chalmers factory.



In the Chalmers pattern shop, all patterns for Chalmers parts are made under the supervision of our own engineers.

The "Toy Makers"

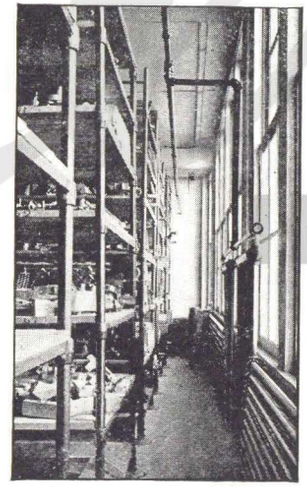
AMONG the world's most skillful wood carvers are the toy makers of Germany---those wonderful artisans who cut miniature figures of people and animals, and even of houses and towns, out of solid blocks of wood. Theirs, however, is an art of little utility. In a great automobile factory like the Chalmers, are wood cutters whose skill lays the foundation of the perfected motor car.

In the Pattern Shop of the Chalmers Company are employed 30 of the most skilled workmen in wood. From the final blue prints of the Engineering Department, these craftsmen build up wooden models of each part. When their work is finished, practically the entire car is modeled in wood.

It is only a toy car, but it is one of the most important toys ever built, for from its modeled forms cylinders are cast in iron, the frames are pressed out of steel, the crank cases and transmission cases are made in aluminum, the door handles and levers are formed in brass.

In this industrial toy shop, too, one gets the first glimpse of the eventual form of the perfected Chalmers car.

All wood patterns are carefully numbered and registered. Those not in immediate use are stored in a fireproof vault. The value of these patterns alone runs into thousands of dollars.



Chalmers patterns are stored in a fire-proof vault. This picture shows one aisle of the vault and the method of storing.

The Chalmers Market Basket

WHEN any particular model of car has reached the wood pattern stage, the period of preparation is completed. Then comes the actual building.

But to build cars requires materials, and to secure the materials for an automobile factory like the Chalmers requires the services of more than a dozen expert buyers.

The Purchasing Department is one of the most important in an automobile factory. Upon whether the materials which go into a car are well purchased or badly purchased, depends to a large extent the ultimate pricing of the car itself. Some cars are high priced in proportion to their actual value because the materials are not bought in the best markets; other cars are high priced because the production of the manufacturer is small.

Chalmers cars give a higher dollar for dollar value than other cars because materials are bought in large quantities and *always at cash prices*. The Chalmers Company, building as it does many thousands of cars a year, is enabled to take every advantage of the market, and into the Chalmers market basket come the world's finest steels, the best gray iron, the best wood, the finest grade of tires, the highest quality of leather, the handsomest and best wearing paints, the highest grade of bearings; and at a lower price than is paid by those manufacturers whose production is only 1000 to 3000 cars a year.

And not only does the Chalmers Company get every advantage of quantity buying; it also buys for the lowest cash rate, *for every bill is discounted.*

Building practically every part of its car, the Chalmers Company does not have to pay any parts manufacturers' profits. This saving goes into added value for the buyers. Chalmers materials for axles, steering gears, transmissions, motors and all of the other parts which are frequently bought by some motor car concerns from specialty manufacturers, are purchased by the Chalmers Company at just as low a price, or lower, than the parts builders themselves could buy the same materials.

The purchaser of a Chalmers car pays only one profit—and that a small profit—to the Chalmers Company. In the price of his car is not included a dozen profits to parts manufacturers.

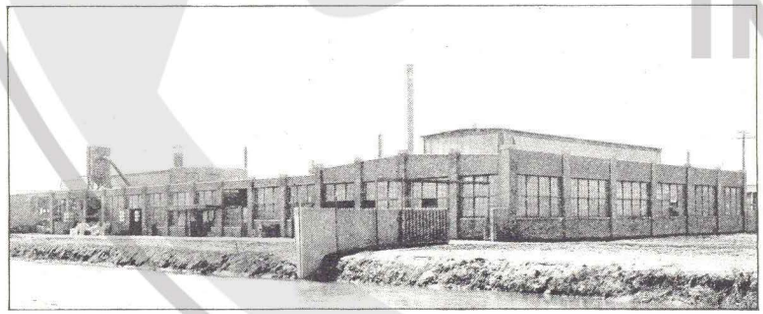
The First Steps

THE single industry of automobile manufacturing is comprised of several constituent industries. When the raw materials have been secured there are drop forgings to be made, castings of iron, brass and aluminum to be molded. In the rough these bear little resemblance to automobile parts. They are like the crudely shaped marble from which the sculptor ultimately fashions the finished statue. Rough as these parts are, their making is of the utmost importance to the service which the finished car is to give.

The Chalmers Company has one of the finest foundries in the automobile industry. In this one branch of the work are employed 250 men. The equipment includes the most improved furnaces for melting brass, aluminum and iron; automatic molding machines, and finishing machinery of the newest pattern.

Chalmers forgings are made by the most improved methods, and quantity production enables the Company to put into Chalmers cars at many points drop forgings where many builders use only castings.

These first steps in the building of a car forecast the value of the finished product. The Chalmers Company could "save" many thousands of dollars on a year's production by skimping these important first steps. But every part is built first, of the best materials; second, by skilled workmen; and third, by the most modern methods. Unprejudiced manufacturing experts have said that greater care could not be taken in building a car at any price than is taken in the building of Chalmers cars.



The Chalmers foundry is one of the largest and most complete in the automobile industry.

The interior of the Chalmers Iron Foundry, showing the molds ready for "pouring."

An Ancient Art in Modern Use

WHEN old Tubal Cain first discovered that he could make a hole in the ground, pour into it molten iron, and get a casting of any shape that he made the hole, he discovered an art which revolutionized the use of metals.

Today the most elaborate castings made by Tubal Cain would appear crude and amateurish compared with the intricate castings made in a modern automobile foundry like the Chalmers.

The building of the molds in which Chalmers castings are made requires the services of over 100 men. And the wonderful structures they build up, only to knock to pieces after the molten metal has been poured into them, are the most complicated used in any branch of the foundry business.

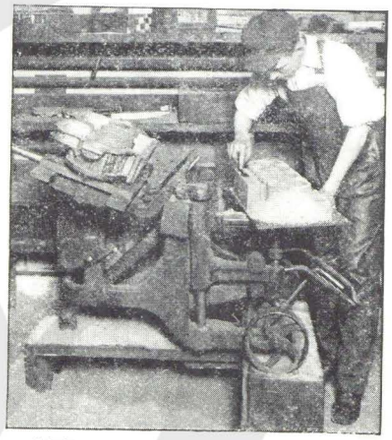
The cylinders for the Chalmers "Thirty-Six," for instance, are cast in a single block of four, and the finished casting has not only the external shape of the cylinders, but a complete water circulation system, valve cages, exhaust and intake manifolds, and all of the bosses and flanges which are necessary in the building of a motor. The perfection of the finished casting depends on the skill of the mold builders.

The workmen employed are the most skillful in the foundry business and the devices used are the most improved—some of them devised by the Chalmers foundry experts.

The Builders in Sand

IN the making of castings there is no more important operation than "core" building.

Out of fine clean sand, specially prepared, are molded the intricate forms which give to castings their internal shape. With infinite care and skill the sand structures are built up. Then they are baked for hours in great ovens to make them hard enough to withstand the heat of molten metal.



Making cores is an operation requiring highly skilled labor.

The builders in sand are highly skilled laborers, for a flaw in the cores which give shape to the water jackets of the cylinders, make crank cases more than mere lumps of aluminum, give fly-wheels their proper form, would mean the entire loss of many hours of labor.

A core-maker is an artist. The figures he builds must be made of sand so fine that it can be blown by compressed air from the finished casting—so accurate that the metal shall be of even thickness and weight. Often a complicated core is discarded because some little part of the structure of sand collapses.

It is the infinite care used in core making and in mold building which gives the Chalmers cars a smooth running motor, perfectly cooled and without flaws.

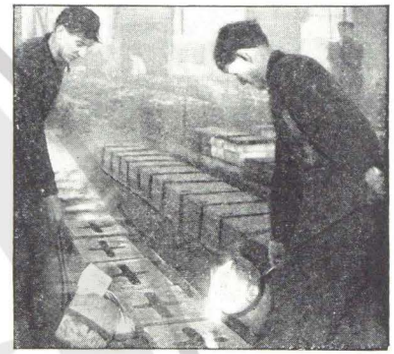
After the cores for Chalmers molds are made they are baked for hours in special ovens. All this work requires infinite care, for the cores are fragile and easily broken. Only the perfect are used.

The First Lieutenants of Nature

NATURE made the iron, but it takes the skill of mankind to bring it into its final usefulness.

After the wonderful molds have been built, it remains for science to get just the right kind of iron for the automobile motor; to fuse its alloys in just the right heat, and then to mold it into shape.

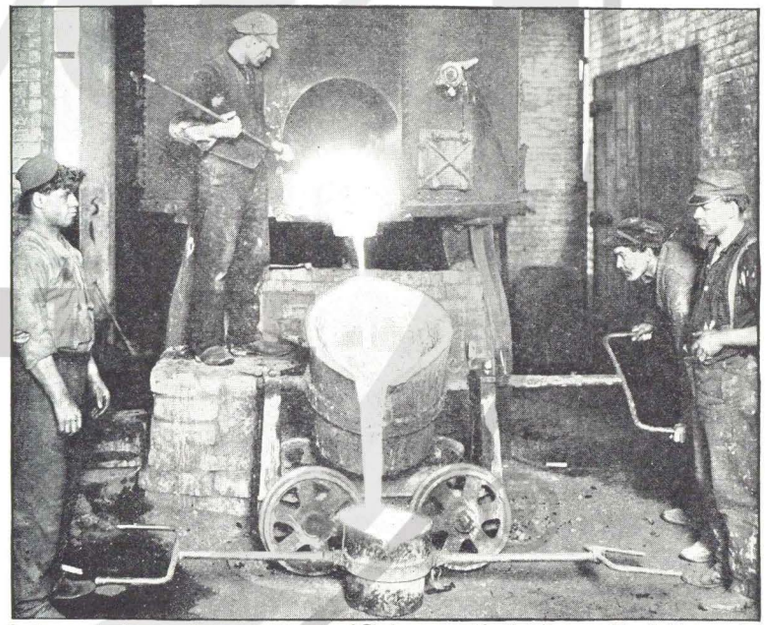
Experts say that the gray iron used in casting Chalmers cylinders is the finest, the strongest, and the best used by any company in the country. The formula of this iron is a secret of the Chalmers engineers.



Men carry great dippers of molten iron, pouring into mold after mold.

In the Chalmers foundry the constituent parts of the iron are melted together in a big cupola furnace. Out of the furnace the iron comes white hot and as fluid as water. The metal is poured into molds where it takes the form of cylinders, fly-wheels, valve cages, exhaust manifolds, pistons and other parts.

And when the iron has cooled, the rough castings go to finishing rooms where they are smoothed off and polished.



In the cupola furnace all the constituents of Chalmers-specification iron are blended by roaring gas flames. The molten iron is drawn into great buckets. The whole pouring operation for one day's output of castings takes less than an hour.

The Modern Vulcan

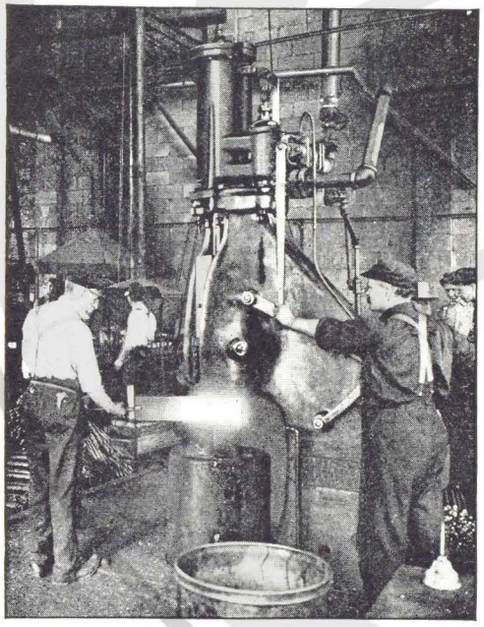
WHEN man left the stone axe and the flint-headed spear, he had learned to make forgings of metal. The first forgings made were weapons. In the early ages, the most skillful forgemen made nothing but accoutrements of war —lance heads, swords, battle axes, and all of the things with which man went out to slay man.

In the present age, forging is one of the greatest agents of peace and happiness. The skill of the early armorers has been applied to the making of the machinery of peace and industry.

Such parts of the Chalmers car as axles, steering connections, crank shaft, cam shaft, gears, propeller shaft, valve stems and scores of other parts are pounded by mighty hammers from the solid steel.

The drop forging gives the maximum of strength in a motor car. Drop forgings are harder to make than castings; they cost more. But they insure safety to passengers and driver and great endurance to the mechanism of the car.

In a trip through the Chalmers factory, one learns that Chalmers cars have more drop forgings than any other cars in their price classes.



A corner of the Chalmers forge. This is one of the drop hammers used in making motor car forgings.

All of these forgings, from the smallest to the largest, are made of Chalmers-specification steel. In the Chalmers factory these special forgings are machined and finished to give a smooth running and powerful car.

Chalmers records show many cars which have traveled from 50,000 to 100,000 miles — and none of these show any crystallization in the Chalmers drop forged parts. Such service is possible only when the best materials and most skilled workmanship are employed.

A 4000 Brain Power Factory

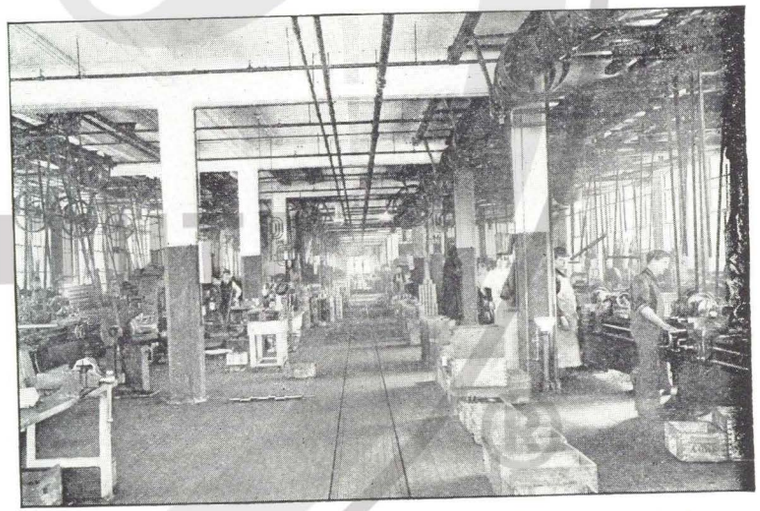
IT is said that the Chalmers Motor Company has a 4000 brain power factory.

There are 4000 men employed in the Chalmers plant, and each man has been selected for his ability to do in the best possible manner a particular sort of work.

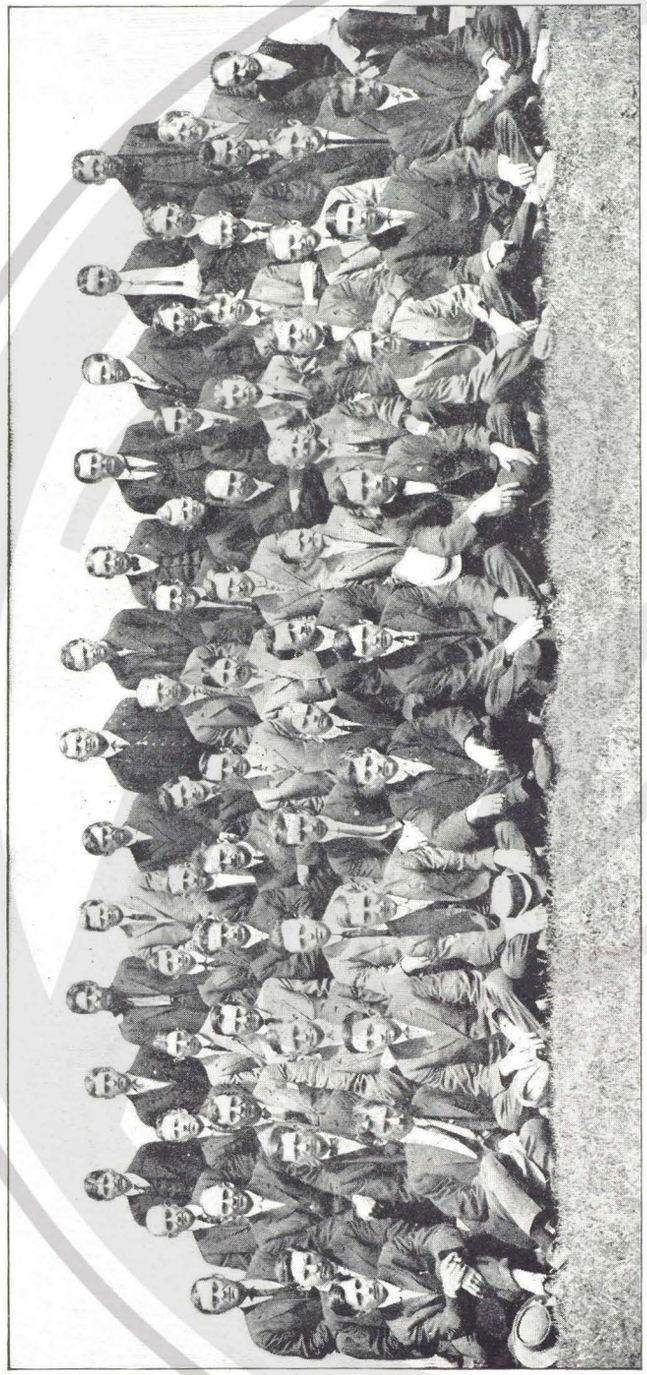
In the group which directs the manufacturing of Chalmers cars are not only manufacturing experts, but mechanical, electrical, and civil engineers. The man at the head of the Chalmers factory is a manufacturing expert who has spent his life in the biggest machinery plants of the country, increasing efficiency and reducing overhead expense and getting big production of high quality. His assistants in charge of the various departments all are top-notch men in their special fields.

These men are trained to manufacture things. They have studied production from every point of view. They are economists in the truest sense of the word, for in the Chalmers factory they demand the best and accept only the best.

These men are the "know how" of the Chalmers factory

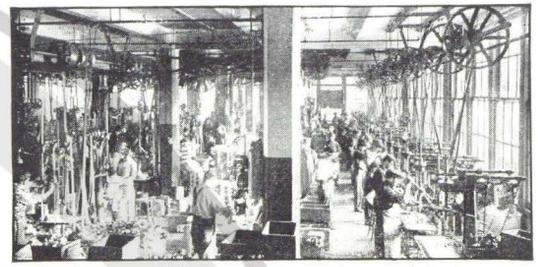


This machining department, in which the parts for Chalmers cars are finished, occupies 24,000 square feet of floor space.



This is the managerial force of the Chalmers factory. The men who compose this group are manufacturing experts. They are the men who direct the big Chalmers factory and make possible high grade production at low cost. They are students of efficiency, trained to eliminate waste and to put into Chalmers cars the highest possible dollar for dollar value.

organization. They design the special tools which reduce the cost of production and increase the efficiency of Chalmers cars.

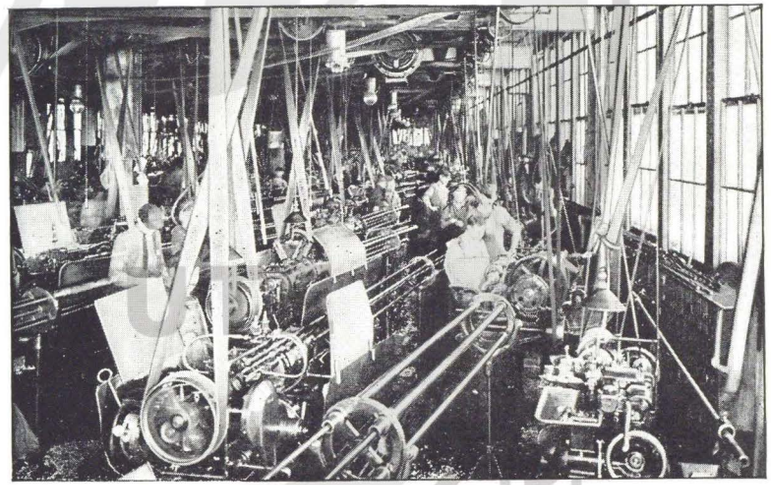


The Chalmers drill press department is one of the largest and most up-to-date in the automobile industry.

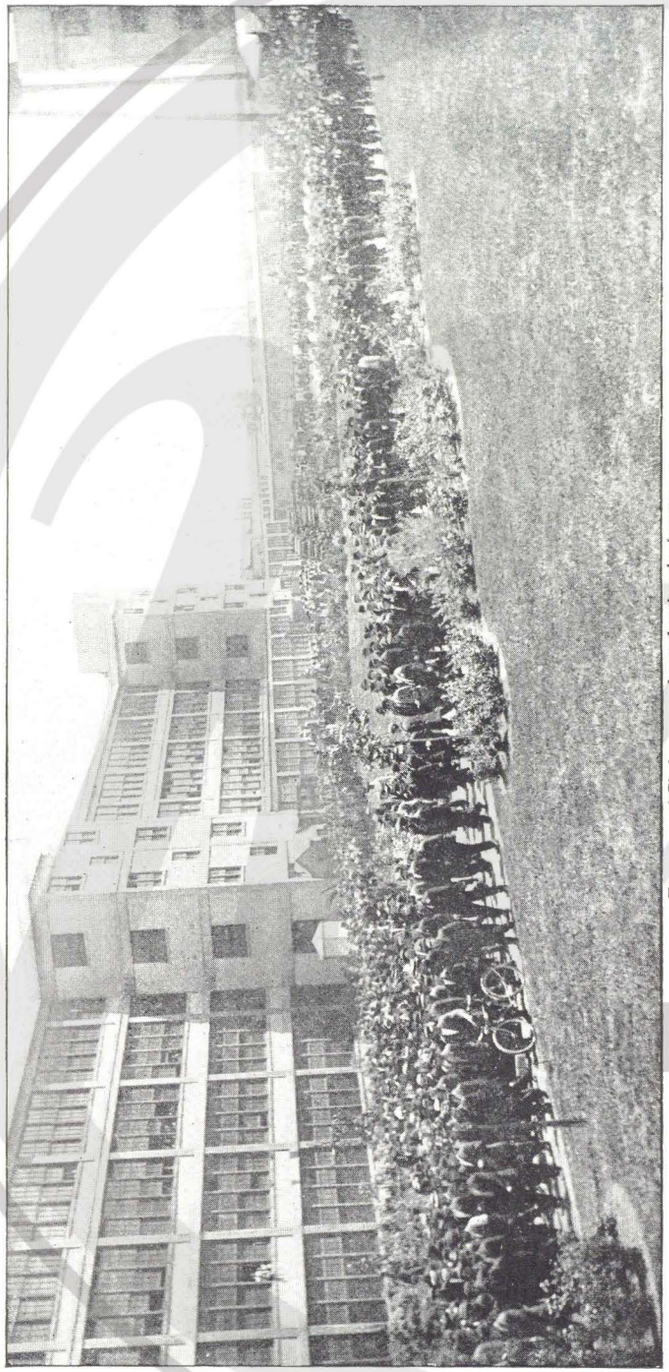
Under their direction are the best workmen that can be secured.

And all of these men work in a big, light factory, built expressly for the manufacture of Chalmers cars. The machinery and the tools that they use are the newest and best. It costs nearly a quarter of a million dollars a year for the Chalmers Company to keep its mechanical equipment up to the Chalmers standard.

But more valuable than either the buildings or the machinery is the Chalmers organization—the 4000 brain power force which works on every Chalmers car.

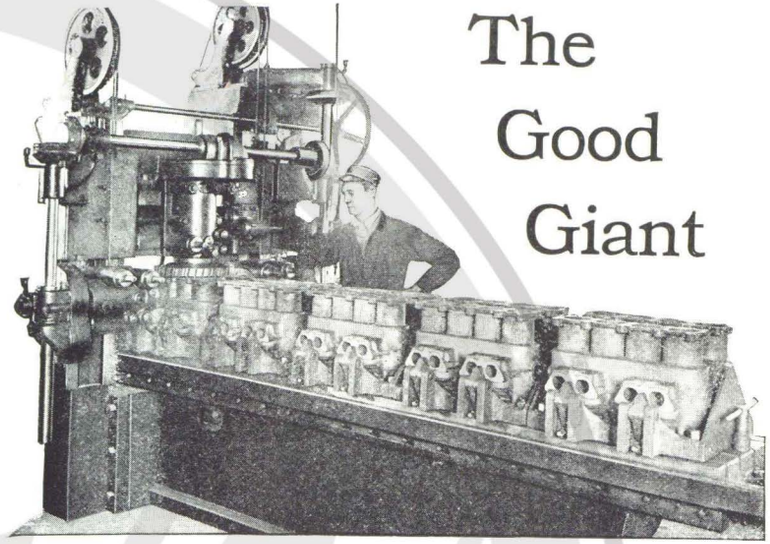


A battery of nearly 100 automatic screw machines is required to make the small parts for Chalmers cars.



The army of Chalmers workmen leaving the factory.

The Good Giant



This milling machine is one of the largest in use. It performs three operations on ten sets of Chalmers cylinders at one time. It weighs thirteen tons. "Save time; be accurate," is its creed.

UNLIKE the giants of fable, who usually labored to work harm to mankind, this mechanical Colossus works to advance civilization and to better transportation.

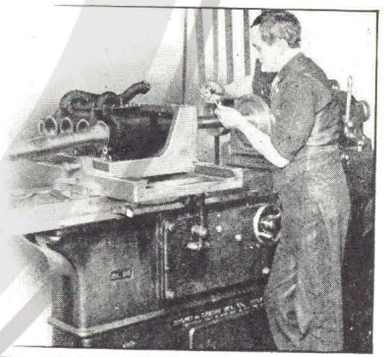
This milling machine, which weighs over thirteen tons, is just one of scores of labor-saving machines in the Chalmers factory.

This big machine will carry 10 blocks of Chalmers cylinders, performing on them three operations at the same time.

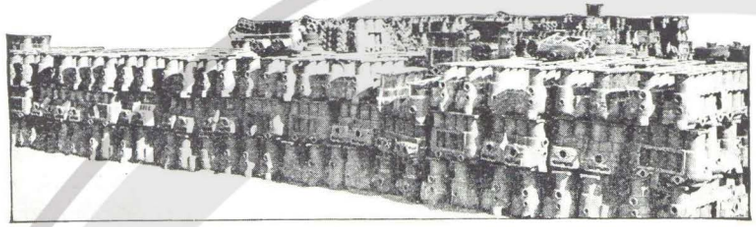
The milling is the first operation on the rough cylinder casting. From the giant milling machine, the cylinders travel from one operation to another, finally reaching the grinding machine which makes the interior as smooth as a gun barrel.

Chalmers cylinders are cut and ground to an accuracy of 1-1000 of an inch. This insures the perfect fit of the pistons.

All operations on Chalmers cylinders, from rough casting to finished product are performed in a space about 50 feet square. It is this system of concentration, of reduction of manufacturing cost, that enables the Chalmers Company to market high grade cars at such reasonable prices.



The cylinders of Chalmers motors are ground on automatic machines to an accuracy of 1-1000 of an inch.



A pile of Chalmers cylinders seasoning before going to the machining department.

Aging the Iron

IRON is generally regarded as one substance which is not greatly affected by time.

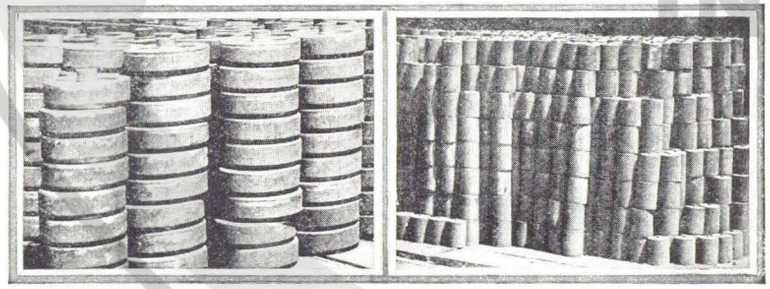
Yet in the Chalmers factory iron is aged—or seasoned—just like good wine or green lumber or anything which is submitted to a seasoning process.

The new iron, as it comes from the foundry, has a tendency to porousness. The fibres are not closely knit; there are infinitesimal spaces between them. This is a condition which exists in all iron and cannot be overcome by any mechanical process.

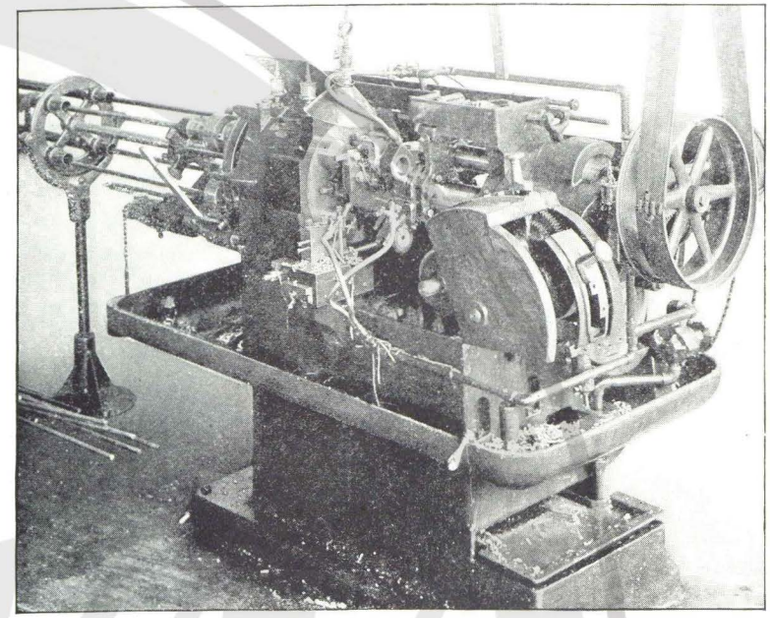
In many automobile factories, the new iron goes right into the motors. But in the Chalmers factory pistons and cylinders and fly-wheels—in fact, all gray iron parts—are exposed to the weather—seasoned—for not less than three weeks. There is something about this exposure to the natural elements which makes the fibres of the iron draw together; the porousness disappears, and the result is well seasoned metal which will not allow leakage, or undue expansion and shrinkage under extreme heat and cold. Aging makes the iron stronger and better.

It is in just such details as this that the Chalmers Company keeps ahead of many other manufacturers, putting into its cars the highest quality and the best workmanship. The time taken to age the iron is more than saved—more than paid for in uninterrupted motor service.

Automobile experts say that even the highest priced cars have no better castings than those in Chalmers cars.



Flywheels, pistons and, in fact, all iron parts are aged before they are used in Chalmers cars.



This wonderful machine can be adjusted to convert bar steel into bolts, screws, or any one of a score of different automobile parts. It is the most improved type of automatic screw machine.

Less Than Human, Yet More Than Human

IN the great Chalmers factory are many machines which perform in a few minutes several operations that formerly took hours of hand work. Among the most wonderful of the hundreds of "automatics" are the automatic screw machines.

Into these almost human machines is fed bar steel; and out of them comes the finished product—magneto couplings, spring bolts, rocker arm screws and similar parts; in fact, one-fourth of all of the small parts which go into an automobile.

These machines which do almost everything but talk are a little less than human because they must be controlled and supplied with material by a man. Yet they are more than human because they do in minutes work that a man could not accomplish in hours. They perform five and six operations at one time and their work is absolutely accurate because they are entirely automatic in their operation.

In the Chalmers factory there is a battery of more than 50 of these machines whose wonderful operations do much to make possible the production of a high grade motor car at a medium price. The Chalmers equipment of automatic screw machines is larger than that of many specialty screw manufacturers.

"Seven at One Stroke"

IN Grimm's Fairy Tales there is a wonderful story of a tailor who gained fortune and fame because he had slain seven at one stroke.

The tailor of fable could not make his proud boast if he walked into the drill press department of the Chalmers Motor Company.

Here there are machines which bore holes as rapidly as 20 at one time. In other words, there are single machines which do the work of 20 old style machines, or of about 50 men working with hand drills.

Equipped with special tools and jigs, all of which are built in the Chalmers factory, these multiple spindle drills reduce by more than half the cost of the same kind of work as it was formerly crudely done by single machine or hand drills.

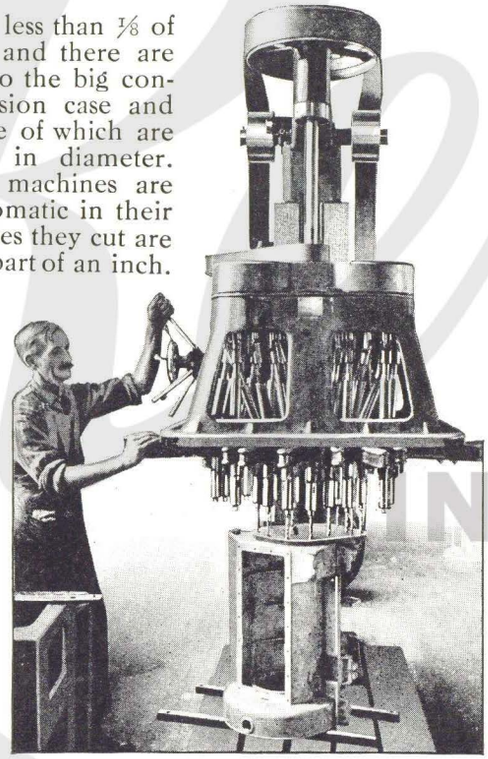
The Chalmers drill press department is one of the most complete in the country. In it is every practical kind of labor-saving drill.

There are fine drills less than 1/8 of an inch in diameter, and there are all sizes from this up to the big connecting rod, transmission case and crank case drills, some of which are more than 6 inches in diameter. All of these drilling machines are automatic or semi-automatic in their operation, and the holes they cut are accurate to the 1-1000 part of an inch.

Accuracy in drilling is one reason why Chalmers cars, even after years of service, run smoothly and quietly.

Low production cost is one reason why Chalmers quality cars are so reasonably priced.

It will pay you, when you buy a motor car, to make sure that it is built by modern, accurate and economical machinery, in the factory of the company whose name it bears.

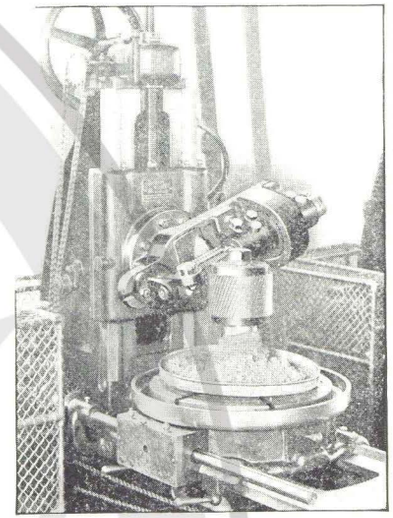


In the Chalmers factory are drills which make as many as 20 holes at one operation. The machine in the picture is operating on a Chalmers crank case.

The Perfection of Obedience

A PERFECTLY obedient human being may never be discovered, but perfect obedience has been reached in machinery.

In the Chalmers gear cutting department are machines which do just what they are told to do and no more. One man supplies them with raw material and takes from them the cut gears. The gear cutters used in the Chalmers factories are purely automatic in their operation. They are the best that money can buy. The spiral gear cutters are among the few imported machines used in building American motor cars.

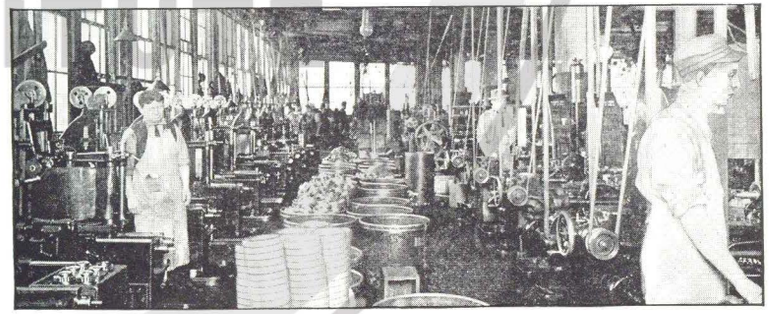


An imported gear cutter making the spiral motor gears for a Chalmers motor. This machine is entirely automatic in its operation.

All of these gear cutters perform multiple operations, some cutting as many as 6 or 8 gear "blanks" at one time.

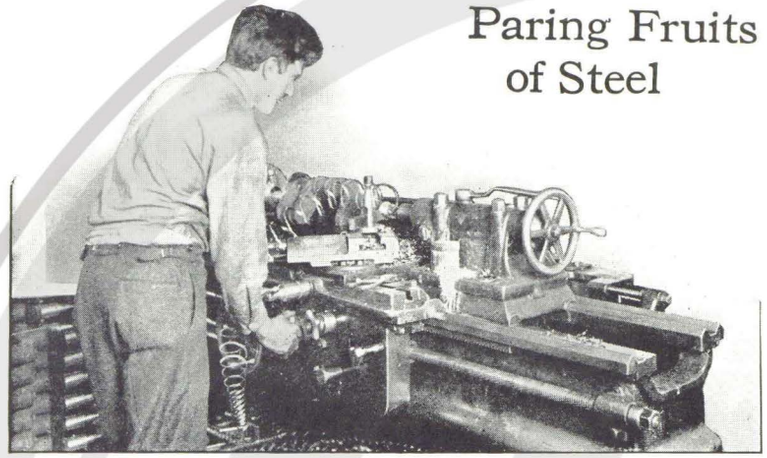
Though these machines cut the hard steel with an almost unbelievable accuracy, Chalmers gears are later ground until each tooth is accurate to 1-2 of 1-1000 part of an inch.

It is this minute attention to detail which gives a quiet and long-wearing car. The driver of a Chalmers will show you how his transmission gears can be shifted easily and quietly at any speed. The reason for this smoothness is the careful cutting, accurate machining, thorough heat treating, and finally, the grinding of Chalmers gears.



The Chalmers gear cutting department is complete in every detail. All Chalmers gears are cut in the Chalmers shops.

Paring Fruits of Steel



Notice the long spiral of steel cut from a Chalmers crank shaft. Only the toughest and best of steel will cut so evenly. The Chalmers Company has never had a case of broken crank shaft.

IN the departments where Chalmers crank shafts and cam shafts are machined, one sees steel shaved from a rough drop forging as easily as the skin is peeled from an apple.

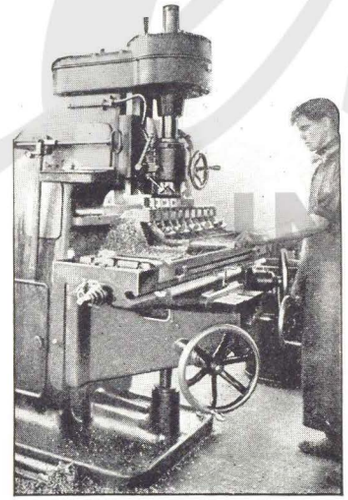
The big lathes are like nothing so much as giant paring knives which cut from a heavy forging spiral parings of steel, sometimes as long as 16 or 18 feet.

These cuttings are the proof of the fine material used in Chalmers cars, for only the best of steel can be cut cold into a spiral strip of great length. Stretched out, some of the cuttings from a Chalmers crank shaft are as long as 40 or 50 feet.

Other machines shave bits of iron and steel. Nearly all machines have "gang" jigs; that is, they operate on several pieces at once.

It is a favorite saying that a penny saved is a penny earned. In the Chalmers factory this might be changed to "a penny saved in manufacturing is a penny earned for the Chalmers owner."

The "jigs" used for multiple operations are also the owner's guarantee of perfection In this way the Chalmers Company puts into its cars the highest degree of accuracy in workmanship at the greatest economy.



Multiple operations reduce the cost ot production. This picture shows a machine finishing 10 Chalmers running board hangers at one time.

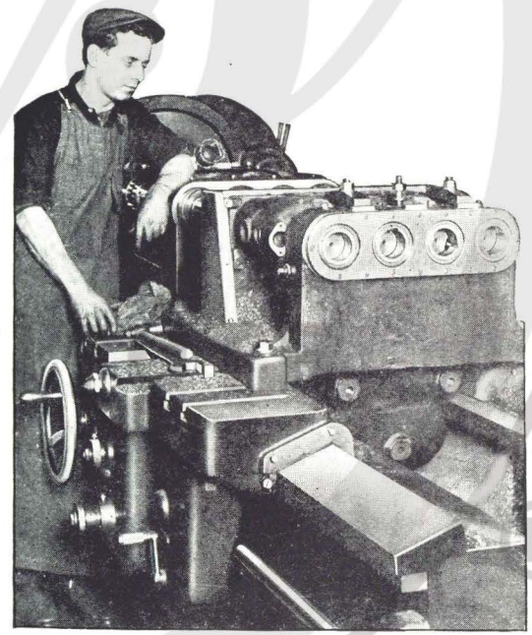
A Perfect Straight Line

SCIENCE teaches that the only perfect straight line is an imaginary line.

A Chalmers motor comes about as near to containing perfect straight lines as anything that has been devised to give smooth operation, quietness and long wear. It is necessary that the cylinders of a motor car be in absolute alignment This is possible only with cylinders cast in blocks and with the interiors machined in a single operation.

In the Chalmers factory, four cylinders are bored at one time on a machine which is automatic in its operation and accurate to less than a hair's breadth. With the cylinder block held in a special jig and the four steel cutters operating on all four cylinders at one time, there is no possibility of having the pistons out of alignment in the completed car.

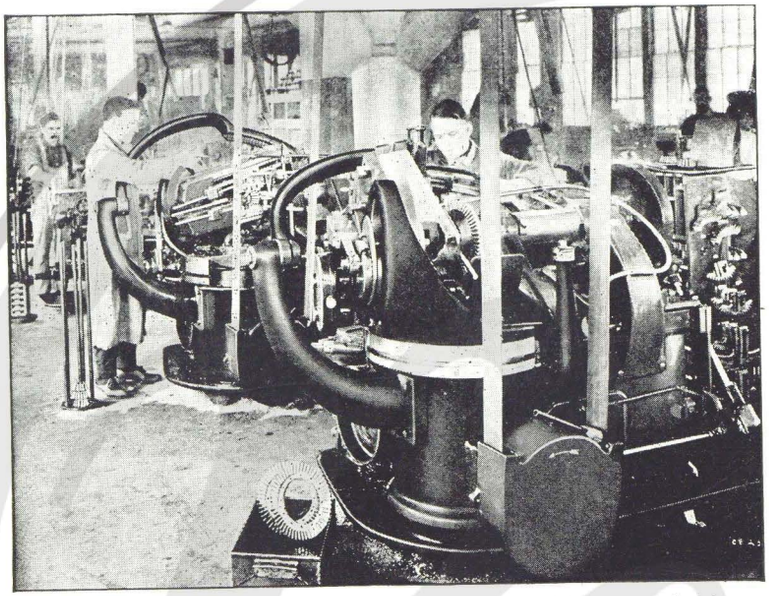
As a result of this fine workmanship and scientifically accurate operation. Chalmers motors operate without friction—silently. They have the endurance and the pull for any kind of work which may reasonably be asked of a motor car.



Chalmers cylinders are bored four at a time on an automatic machine which insures perfect alignment. The bore of Chalmers cylinders is accurate to 1-1000 of an inch.

From the rough casting to the finished cylinder block, all cylinders of a Chalmers car are bored, ground and finished on automatic machines which operate on all cylinders at once.

In addition to smoothness of operation and good wearing qualities, this system reduces the cost of production and enables the Chalmers Company to build a car of the highest mechanical quality at the lowest possible manufacturing expense.



A battery of the most improved gear "slashers" cut Chalmers driving gears and pinions. These machines are automatic and as accurate as science can make them.

"It Would Talk If It Had To"

NO more wonderful machines are used in the building of an automobile than the gear slashers and shapers which make the driving gears and pinions for Chalmers axles.

During a trip through the Chalmers factory, the writer remarked to a companion that these machines, with their various operations and their automatic movements, seemed supernatural—that they were almost human. And a workman who stood near said: "Those machines would talk if they had to."

In the Chalmers axle plant are more than a score of these gear cutting and shaping devices.

When working, they seem actually to move in four or five different directions at the same time. From a solid piece of steel, they cut with more than human accuracy the beveled gears which drive the finished cars.

Even to the complicated shaping of the teeth, graduated from the thickness of nearly an inch to less than a half inch, these big cutting machines perform every operation in the cutting of a driving gear.

It is such equipment as these improved gear cutters which insures the high quality of Chalmers cars. Not even the highest priced cars have quieter or better wearing axles.

A general view of the sheet metal department of the Chalmers factory.

Tailoring Cloth of Steel

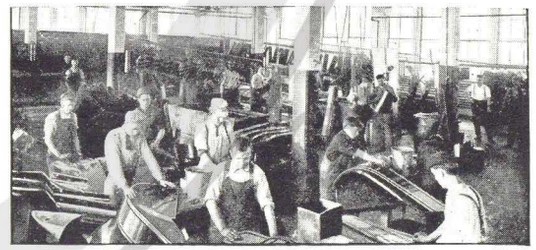
IN the Chalmers factory is one department with 24,000 square feet of floor space which is like a great tailor shop where sheet steel is used instead of cloth.

This is where Chalmers fenders, motor bonnets, mud pans running board aprons, and other sheet metal parts are made. In this one department alone are employed nearly 200 people.

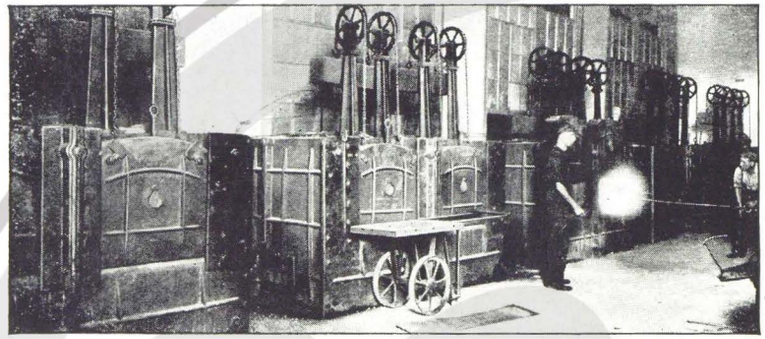
Every device for the rapid and efficient handling of sheet metal is used in the Chalmers factory. In this department one sees the sheet steel reinforced with heavy wires and with drop-forged fender irons. And watching the various operations, one realizes why it is that a large sized man can sit on a Chalmers fender without bending or breaking it.

As a part of the sheet metal department, is the big enameling room where parts are finished.

Chalmers fenders have a complexion which is fired into the metal. In the enameling room are great vats of enamel in which the parts are dipped. Then they are placed in gas ovens, each of which is as large as an ordinary room. After each baking, the enameled parts are carefully rubbed down with pumice stone to give a hard and lasting finish. Four times each fender is dipped and baked, or rubbed. And that is why the color stays on Chalmers fenders.



In this room Chalmers fenders, bonnets and many other parts are enameled by the best and most up-to-date process.



In these furnaces Chalmers parts are baked for hours in the heat treating process. Average heat for carbonizing, 1600 to 1750 degrees.

The Well Baked Loaf

THE steel which goes into Chalmers cars is baked very much like a loaf of bread. No one would willingly eat a half-baked loaf if he could get one well baked. Nor would one who knows want half-baked steel in his motor car.

When steel is submitted to the force of a blow of several tons in drop forging, the molecules of the metal are forced apart. The effect of drop forging on steel is much the same as the effect of violent exercise on the muscles of a human being.

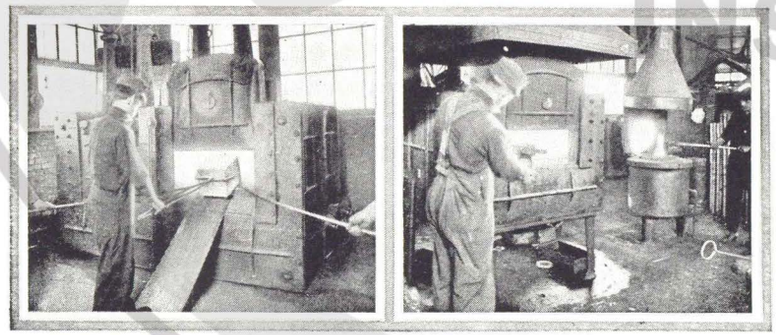
And just as the muscles of an athlete require massaging and rubbing after a contest, so does steel require heat treating.

Heat treated steel is stronger than steel not heat treated.

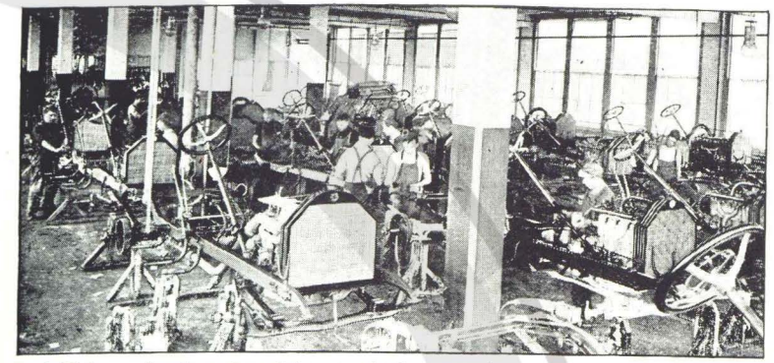
Chalmers cars have more heat treated parts than any other cars in their price classes.

The Chalmers heat treating department is one of the largest and most complete in the automobile industry.

Heat treating is one of the least understood processes of automobile manufacture, yet it is one of the most important from the owner's point of view. Heat treating is the guaranty of the long life of the working parts in a car.



Drawing heat treated parts from a furnace prior to tempering them in oil These furnaces are for carbonizing the nickel steel gears and parts for Chalmers cars. After annealing, re-heating and tempering in oil Chalmers gears have a hard, durable "case" and a non-crystallizing "core."



Each Chalmers chassis receives eight coats of paint, put on by experts in the Chalmers shops.

The Color That Wears

PAINT is one of the most important factors in the good looks of a motor car. If the paint cracks or wears off, the car soon looks shabby.

Chalmers paint is put on to stay.

Each Chalmers chassis receives eight coats of special metal paint. Chalmers fenders, motor bonnets and radiators are colored with baked-on enamel.

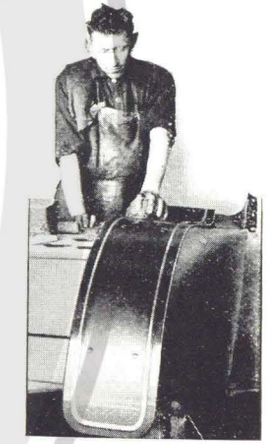
Chalmers wheels are painted by a special process which insures an even and long-wearing color. All striping is done by hand by experts.

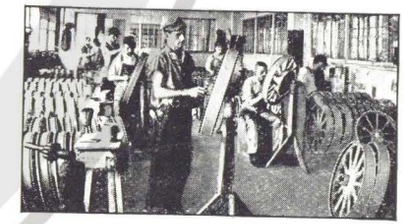
In Chalmers bodies has been reached the height of the body finisher's art. Each all-metal body receives 21 coats of paint and rubbing varnishes.

No cars are better or more painstakingly finished. Even cylinders are enameled to give a clean appearance.

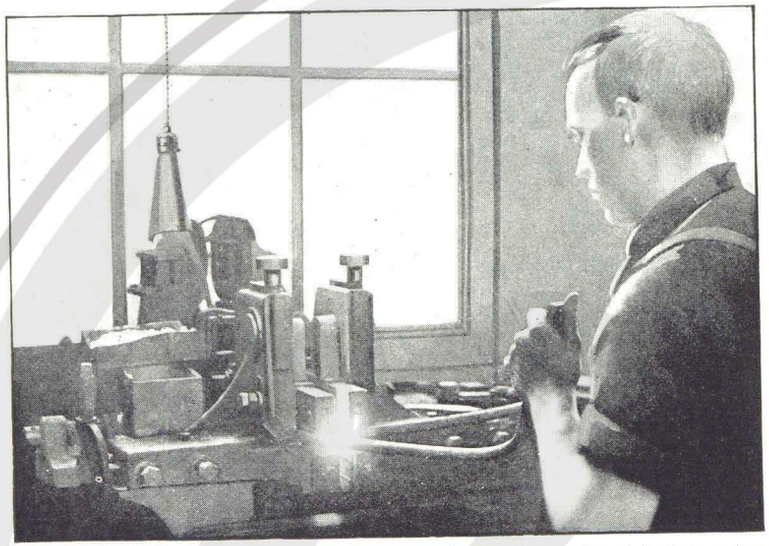
Throughout the big paint shops are employed only the highest class of finishers, who give to Chalmers cars a color dress which wears.

Chalmers finish, combined with handsome lines, has given Chalmers cars a reputation for beauty and style. A Chalmers car "looks."





No cars are better finished than the Chalmers. Fenders, radiator and motor bonnet are finished with baked-on enamel. After each coat of enamel is applied, the surface is carefully rubbed down, giving to the finished product a high lustre and a hard, durable surface. All of the striping is done by hand.



The electric welding machine makes possible the production of complicated forgings at low cost. This macnine accomplishes in 10 seconds work that took an hour by old methods.

Industrial Magic

THE building of a motor car strong enough and smooth enough in its operation to withstand the wear of several seasons of constant use, yet inexpensive enough to be within the reach of the man of average income, has taxed the ingenuity of the best brains in the engineering and manufacturing world.

In the Chalmers factory one sees many machines which are almost magical in their operation. There are machines which are entirely automatic. Others perform three and four operations at one time. Some operate on 18 to 20 pieces at once.

But no machine so nearly approaches the magical as the electric welding machine in the labor and money it saves, in the speed with which it operates, or in the quality of its results.

Take a fender iron, for instance. This one part is so bent that it could be drop forged as a single piece only at great expense. In the Chalmers factory fender irons are drop forged in three pieces. Then these pieces are put in an electric welding machine. One instant there are two pieces of cold steel. In five seconds these pieces are white hot. In ten seconds they come from the welding machine a solid piece, and by actual test stronger than a similar piece drop forged as a unit.

This is just one of scores of labor saving methods used in the Chalmers factory. This is just one reason why the Chalmers Company can build a quality car at a medium price.

Chalmers clutches and transmissions are put together by specialists. Nearly 100 men are employed in this work alone.

The Master Builders

THE manufacture of the small parts which go into a motor car is only one step in automobile building. In the Chalmers factory the hundreds of different parts, and the thousands of each kind of part, are built into the completed car by master motor car workers.

First, there are the sub-assemblies—departments in which the steering gears, the motors, the axles, transmissions, clutches, and so forth, are brought together ready for the main assemblies. Then there are the two chief assembly departments—the one in which the chassis is assembled complete; the other in which the body and all of the equipment are fitted.

In the Chalmers factory what is known as the progressive system of assembling is used. That is, all of the workmen are specialists.

In the motor assembly department, for instance, one group of men fits piston rings; another group fits connecting rod bearings and bolts; another group brings the connecting rods and pistons together; yet others

Chalmers motors are noted for their clean appearance. This is largely due to the neat handling of all wiring and tubing. This picture shows the department where the wiring is assembled.

The motor assembly department of the Chalmers Company has been pronounced by experts one of the most complete and up-to-date in the automobile industry. Each man does one kind of work, and is an expert in his line.

assemble the motor gears; others fit valves; and finally another group assembles all of these various parts into the completed motor.

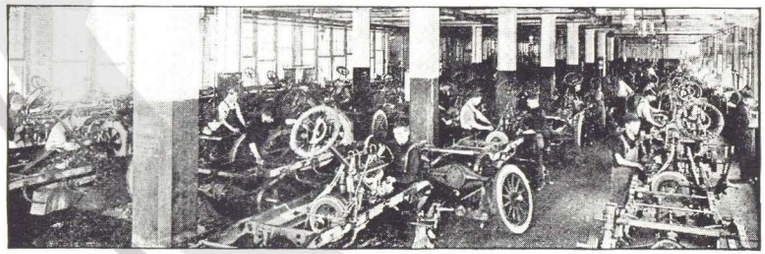
Each man does one kind of work, and that one kind only. He is an expert in his line.

The result is a power plant as nearly perfect as accurate manufacturing and human skill can make it.

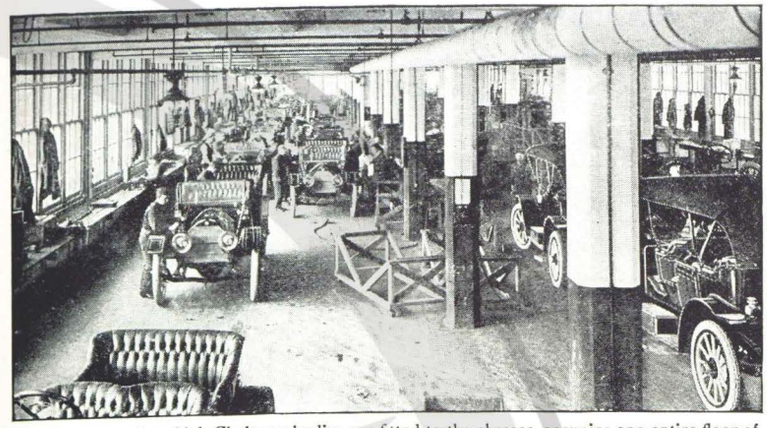
The same progressive system of specialized work prevails in all of the assembling departments.

Not only does this system insure the highest quality of workmanship, but it gives the Company an absolute check on every piece of work necessary in the building of a motor car. The heads of the various departments know exactly by whom any mistake is made. Thus the error may be corrected before it has traveled very far.

This assembling method is possible only in a factory where the various small parts are made with the utmost accuracy and are positively interchangeable. Chalmers parts are interchangeable. A piston which fits one cylinder will fit any other cylin-



The chassis assembly department is where the "works" of a car are put together. Nearly 200 men are employed in the putting together of Chalmers chasses.

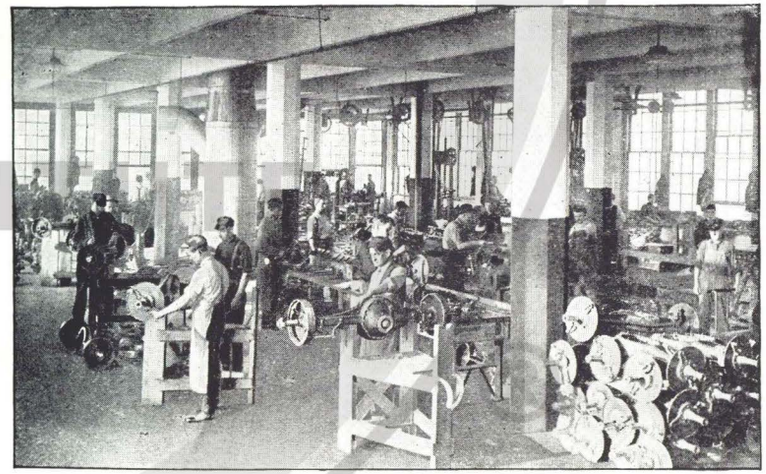


The department in which Chalmers bodies are fitted to the chasses occupies one entire floor of a building 60 x 400 feet. The capacity of this department is 40 cars each working day.

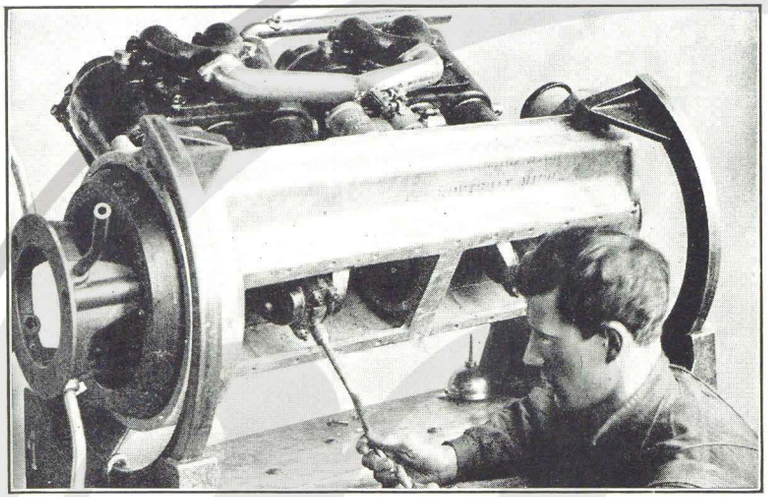
der of the same model. The transmission which operates correctly for one car is equally efficient in another car.

No car at any price is built with greater care than the Chalmers. The whole system of the Chalmers factory, both in the manufacturing and in the assembling divisions, is in charge of manufacturing experts who have designed it to give the best possible results at the lowest cost of production.

The writer has talked with manufacturing experts in other lines and with men high in the automobile world who have visited the Chalmers plant. Without exception, these experts have said that the Chalmers factory is one of the most complete, most up-to-date, and most efficient in the entire automobile industry.



One of the most important tasks of the automobile engineer is the building of the rear axle. The rear axle assembly department of the Chalmers factory offers every facility for the highest quality of workmanship.



The smoothness and quiet operation of an automobile motor depend upon the accuracy with which the various parts are put together. Each piston must fit perfectly. The crank shaft must turn without friction. The connecting rod bearings must be tightened with the minutest accuracy. The Chalmers method of assembling motors insures the maximum of power smooth operation and endurance.

The Source of Life

THE most important part of a motor car is the motor, for without the motor there could be no automobile. It is the most vital part—the very heart of the car.

Therefore the building of the motor is the most important work done in an automobile factory. Chalmers motors are built complete in the Chalmers plant. Two hundred men are employed exclusively in the assembling of Chalmers motors.

One has to make a thorough inspection of this department to understand the great care used in building this most vital part of a Chalmers car.

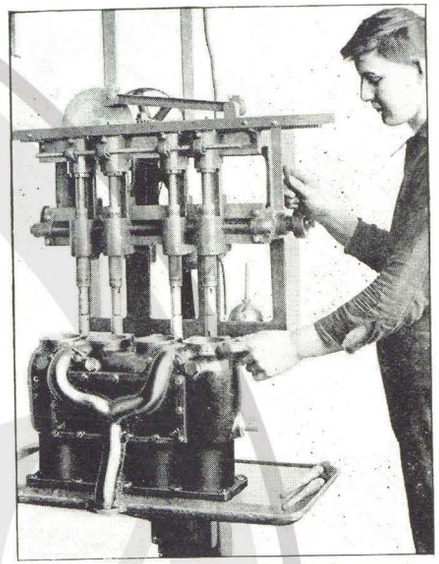
In the first place, the Company has taken every precaution to eliminate waste. The small parts come in at one end of the motor assembly department and the finished motor comes out at the other end. In the line of progress through this department are groups of men who specialize on the various motor parts. Each man does one kind of work, and does it as rapidly as is consistent with perfect accuracy.

A great deal of the work of motor assembling is mechanical. Special machines are used to fit the connecting rod bearings, to assemble the big crank shaft bearings and the fly wheel on the crank shaft, to grind in the valves, and so forth. But where hand work is best, hand work is used. And only the most highly skilled hands are employed.

Throughout the progress of assembly, each step is rigidly

inspected. Nothing which is not exactly as it should be is accepted for the completed motor. An accurate and rigid check is kept on each step of the motor assembly.

To increase the efficiency of this department, the Chalmers Company has even gone so far as to design a special motor stand which enables one man to turn to any position and to handle with ease a motor weighing several hundred pounds. This is simply a detail, but it is an important detail from the owner's point of view, because it shows how the heads of the Chalmers Company are always studying to accomplish the best results at the minimum of cost. This saving means higher value for the owner—better materials put in the car, more accurate workmanship. The Chalmers motor assembly department has been the pattern for some of the leading factories of Europe whose experts have visited the Chalmers factory and pronounced the Chalmers method best.



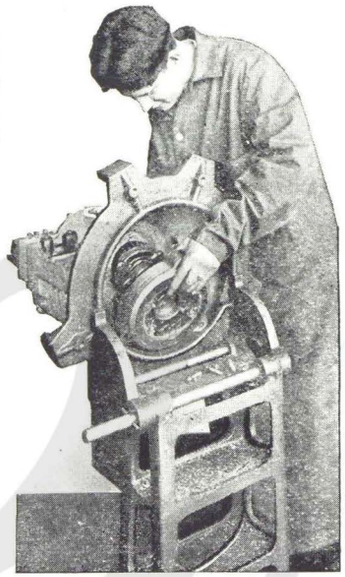
Chalmers valves are ground into their seats by a special machine which operates on four valves at a time. Perfect valve operation is characteristic of Chalmers motors

Each man in the Chalmers motor department is a specialist. The men shown in the picture are assembling connecting rods, pistons and fly wheels. They do nothing else, and as a result, their work is as accurate as human skill can make it.

The Muscle Builders

WHAT the muscles are to the human body, the transmission, the clutch and the steering gear are to the motor car.

The transmission gears represent the amount of muscular energy which the motor applies to its work. They bear the heaviest strain when the car is in motion, for through them the power is transmitted to the driving wheels. To operate noiselessly and to wear well, transmission gears must first be cut from the best material and finished with the utmost accuracy; then they must be assembled with the minutest attention to fit and smoothness of operation. That's how Chalmers transmissions are made.

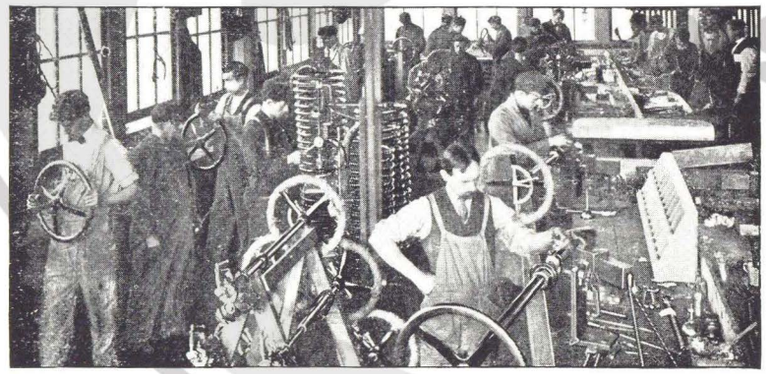


The clutch and transmission assembly is one of the most important parts of a motor car. Chalmers clutches and transmissions are assembled right. Therefore they operate right and wear well.

The specially designed Chalmers clutch is assembled with the transmission. The hardened and ground saw steel discs are fitted to assure positive clutch action without slipping or jerking.

The Chalmers steering gear is designed and built in the Chalmers shops. Its parts are of extra weight and quality.

The care used in building Chalmers steering gears is worth the special consideration of the motor car purchaser, for no part of the car is so vital to the safety of both driver and passengers as the "rudder." Such a steering gear as the Chalmers insures absolute control in any emergency.



Perfect control of the car is vital to the safety of driver and passengers. Chalmers steering gears are made of the finest materials. The forgings are extra heavy and the entire steering mechanism is built with the utmost regard for the important work it has to do.

The Top That Spins Perfection

THE heavy flywheel of a motor, with its strong momentum, is the thing which gives balance and a continuous application of power. The purpose of the flywheel is to eliminate the natural jerkiness which results from the series of explosions in a motor; to carry the force of one explosion on to the next so that the power of the motor will be delivered steadily to the driving mechanism of the car.

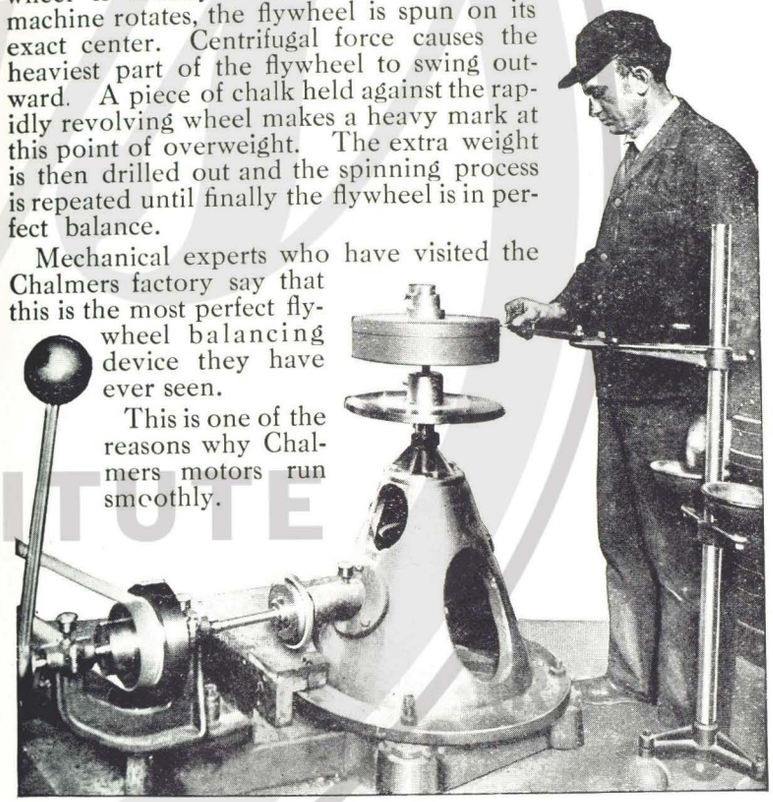
To do this without creating excessive friction in the motor bearings, without throwing the whole mechanism out of alignment, the flywheel itself must be in perfect balance.

Chalmers flywheels are balanced on a machine which is like nothing so much as a magnified top.

The Chalmers flywheel balancing machine is driven entirely by friction. At the top of a rapidly revolving shaft, the flywheel is loosely hung. As the balancing machine rotates, the flywheel is spun on its exact center. Centrifugal force causes the heaviest part of the flywheel to swing outward. A piece of chalk held against the rapidly revolving wheel makes a heavy mark at this point of overweight. The extra weight is then drilled out and the spinning process is repeated until finally the flywheel is in perfect balance.

Mechanical experts who have visited the Chalmers factory say that this is the most perfect flywheel balancing device they have ever seen.

This is one of the reasons why Chalmers motors run smoothly.



A perfectly balanced flywheel is essential to the smooth operation and the long wear of a motor. Chalmers flywheels are balanced by the most accurate method known to science.

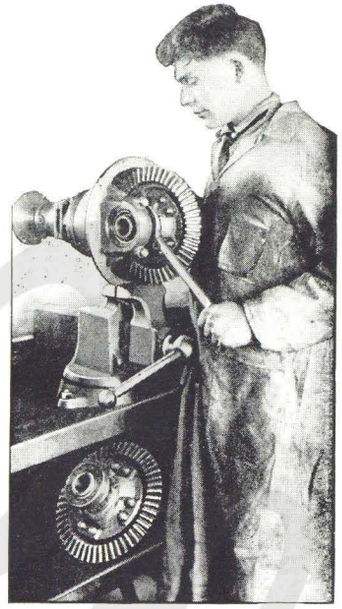
The Punch That Counts

THE rear axle is the part of a motor car which delivers the punch that counts. It is the rear axle which makes the wheels go round; which actually carries the car over the road. To operate satisfactorily, a rear axle must be frictionless, silent, strong.

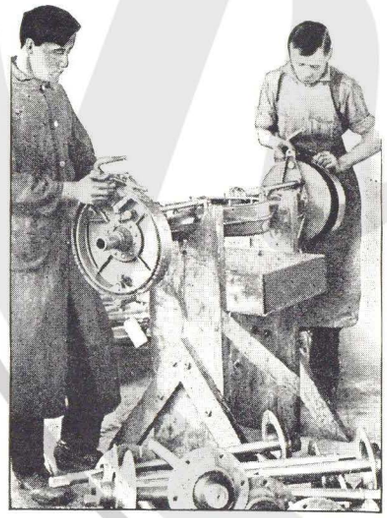
Chalmers axles are all of these things, because they are built from the Chalmers design, of Chalmers-specification materials, in the Chalmers shops, and under the rigid Chalmers inspection.

The Chalmers rear axle is of the full-floating type with live axles and gears of nickel steel, thoroughly heat treated.

The axle housing is of heavy pressed steel, fully trussed and chemically welded into a single piece. This is the lightest and strongest axle construction known. It is also the smoothest running and the most accessible from the driver's point of view.



The Chalmers rear axle is known for its quiet, smooth running qualities. This is due to accurately cut and ground gears of the finest steel, and to careful assembling methods.

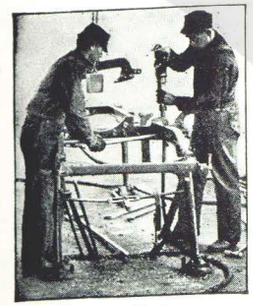


The owner of a Chalmers car very rarely sees the inside of the rear axle case. This is because Chalmers axles are built in the Chalmers shops under rigid Chalmers inspection. No axles are more carefully put together.

So important are the axles in the make-up of a motor car, that the Chalmers Company has a separate four-story building devoted exclusively to axle construction.

Not only does the manufacturing of Chalmers axles in the Chalmers plant give a stronger and a quieter axle, but it saves also the profit which many automobile builders pay to special axle manufacturers. This profit saved is put into quality so that Chalmers cars, even at a medium price, have axles quite as strong and silent as the very highest priced cars.

Stripped for Action



The frames of Chalmers cars are of extra heavy pressed steel thoroughly heat treated. The various side and cross members are hot riveted together, making the whole frame as strong and solid as though built from a single piece of metal.

IN the chassis building division, one finally sees the completed "works" of the car. Here all of the parts are brought together in harmony to do the real work of an automobile.

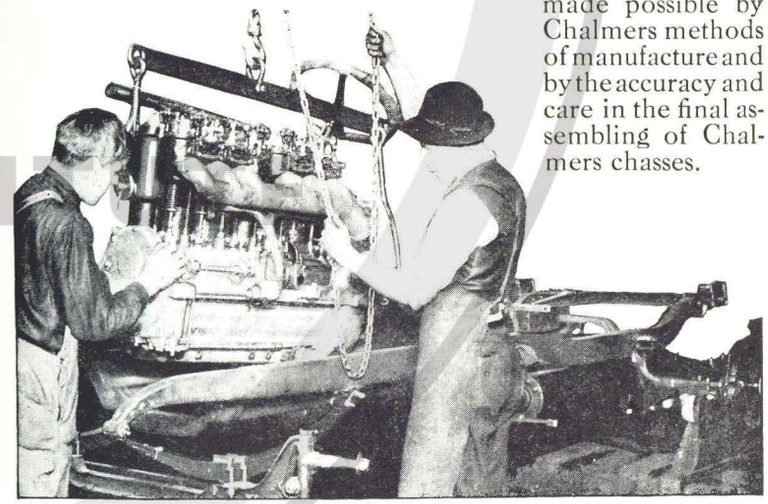
A Chalmers chassis is a perfect example of team work.

Almost any man can build some sort of automobile body, but only a great factory like the Chalmers could build such a chassis as the Chalmers.

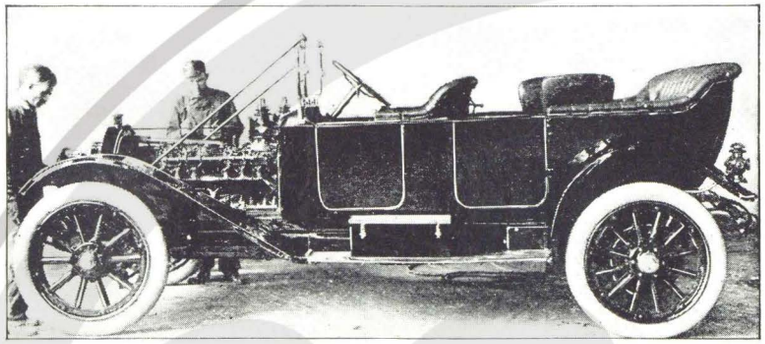
In the chassis division the advantages of specialty assembling are particularly impressive. When one learns that the men who hot-rivet the frame members, making the whole as solid as though built from a single piece, do nothing but rivet frames; that the men who fit axles and springs do nothing else; that each man is a specialist—then one realizes how it is possible to build a strong, quiet, up-to-date chassis at a medium price.

In the Chalmers chassis department 250 men are employed, and the rate of production averages 40 cars each working day.

Mechanically, Chalmers cars have always been leaders. The Chalmers chassis is built up along the most advanced lines, yet with nothing freakish or untried. The Chalmers chassis is built for service, endurance, and smoothness. These qualities are made possible by Chalmers methods of manufacture and by the accuracy and care in the final assembling of Chalmers chasses.



The building of a Chalmers chassis calls for the highest grade of workmanship. The Chalmers chassis is right in every detail. Each part works in harmony with every other part. It is a perfect example of team work.



Each detail of "final" assembling calls for the most careful workmanship. Chalmers bodies, fenders, running boards and so forth, fit without squeaks. Chalmers cars are rightly put together.

In Company Dress

FROM chassis assembly department to finish assembly floor is the final step in the actual building of a motor car.

Chalmers cars receive the final touches—have their company dress put on—in a department which is a good-sized factory in itself. One entire floor of one of the largest buildings—24,000 square feet of floor space—is given over to the fitting of bodies and the final equipment of Chalmers cars. The chassis, without wheels, body, or equipment, comes in at one end of this big department. It travels steadily up one side of the building and then down the other side, and when it gets back to the starting point it is a complete Chalmers car, ready for service.

In this department one soon learns how Chalmers cars have won their reputation for beauty, comfort and convenience. Chalmers bodies are made of heavy sheet metal, and each body receives twenty-one coats of paint and rubbing varnish. The upholstery is eleven inches deep, with Turkish cushions as soft as a down pillow. The metal trimmings—door locks, robe rails, lamps, etc.—are the best that money can buy. Even in such small details as the carpet in the tonneau and the covering for the front foot boards, there is a constant striving for the highest quality and the greatest accuracy of workmanship.

The experiences of 27,000 Chalmers owners have taught the Chalmers Company how to make these cars convenient. Everything that the driver needs to touch to handle the car is within easy reach. On the dash are all controls and indicators for the various systems of a motor car.

And the Chalmers system of building for the buyer gives a medium-priced car of the highest quality and handsomest appearance; a car which has "class;" which, as Elbert Hubbard once said during a trip through the Chalmers factory, has "looks" to a greater degree than any other car.

Tailor-Made Tops

THE Chalmers Company has one of the largest top departments in the automobile industry. In this single division of the factory are employed nearly 300 people who make exclusively tops, seat covers and storm curtains for Chalmers cars.

Many automobile manufacturers buy their tops from specialty manufacturers. The Chalmers Company, however, believes it can secure higher quality, better fit and better style by making the tops for Chalmers cars right in the Chalmers factory.

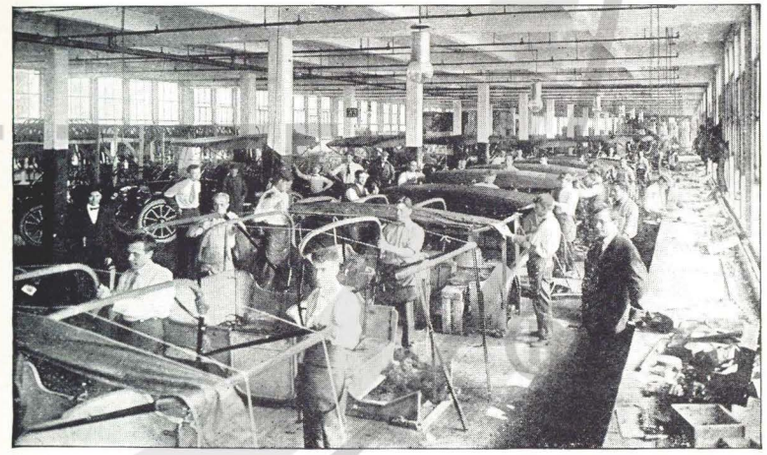
Here, as elsewhere, only the highest skilled labor and the finest quality of materials are used.

The Chalmers top department is like a great tailor shop. Each top is built up on a body of the exact model on which the top is to be fitted. And then, before the top leaves the factory, it is actually fitted to the car that carries it.

No suit of clothes could be made with greater care than Chalmers tops and seat covers.

Here, as elsewhere throughout the plant, the Chalmers Company employs the most up-to-date methods. The heavy materials, for instance, are cut by electrical knives capable of handling as many as 50 pieces of cloth at one cutting. All of the stitching is done on the most improved power machines. The tops themselves are padded with the finest hair, and the bows are finished with the best hardware.

An automobile top serves two purposes: first, protection from sun and rain; second, it adds style to the appearance of a car. The Chalmers Company makes Chalmers tops serve both of these purposes in the highest degree.



Chalmers tops in the making. Note how each top is being built up on a body. The Chalmers top department is one of the largest and most complete in the industry.

The full inspection force of the Chalmers Company is over 300 men, each specially trained for a particular kind of automobile inspection. At the head of this force is a man who has degrees as a mechanical, electrical and automobile engineer. Nearly all of his assistants are mechanical engineers. Every man in the inspection division is an expert. The word of these men is law. Nothing, from raw material to finished car, which does not have their O. K. can be put into the Chalmers product

$300,000 For Inspection

THE Chalmers Company spends a yearly average of $300,000 on its inspection department.

Perfection is a big thing to strive for—the biggest thing in the world.

And in the Chalmers factory they are investing nearly a third of a million dollars a year to make Chalmers cars as near perfection as man can make anything.

From raw material to finished product, the materials which go into a Chalmers are always under the eye of an inspector. First the steels, the iron, the brass, the wood of the wheels, the paint on the bodies, the hair in the upholstery—every piece of raw material is put under the microscope of inspection. It must measure up to Chalmers specifications.

Then each stage of manufacture is watched with the utmost care. Each part is tested. When that part is assembled, it again receives a grueling test. Each sub-assembly of the motor, for instance, gets its special work-out before it is assembled in the power plant. Then the completed motor is put through its paces. And finally when it is put in a chassis, it is given further rigid tests.

These are the methods by which the Chalmers Company is striving to spell the word "perfection" in Chalmers cars.

And, to those who know, inspection is the most vital thing in the manufacture of a car. It is the owner's guaranty of good service under all conditions. It is an insurance against wear, for inspection consists not only in finding flaws in material, but in making sure that each part works in perfect harmony with every other part.

The men of the inspection force are the autocrats of the Chalmers factory. Their word is law. No matter how urgent might be the factory's need of any special part or of any kind of material, unless that material or part had received the O. K. of the inspection department, it could not go into a Chalmers car.

Wherever one goes in the big Chalmers plant, one sees inspectors at their work. And, watching the methods they use and the care with which every detail is gone over, it is not hard to see why Chalmers cars have won a nation-wide reputation for endurance and consistent service; it is not hard to see why Chalmers cars four and five years old are today running perfectly, and why the owners of Chalmers cars are loyal to them.

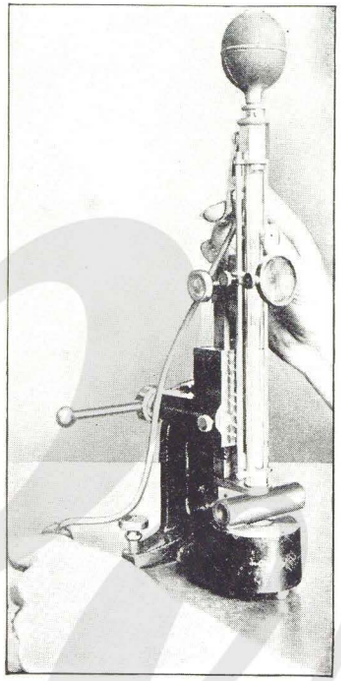
The Bounce of Fate

PERHAPS the most important thing about a motor car is the steel which goes into its various parts. Testing the strength and hardness of steels is one of the most important tasks of the Chalmers Inspectors. Teeth of gears, for instance, must be hard to an exact degree to give smooth operation and long wear. The crank shaft must be of a certain weight and hardness.

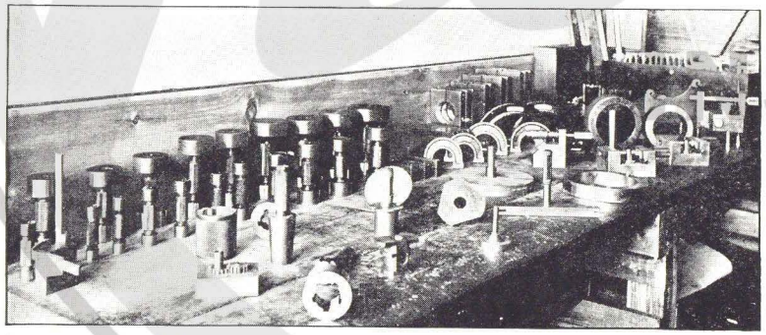
Soft steel wears easily. Hard steel shows practically no wear after many thousands of miles of service in a car.

To test the hardness of Chalmers steels, an instrument called the scleroscope is used. The scleroscope consists of a graduated glass tube, from the top of which a hard steel ball is dropped. This ball hits the metal and bounds back up the tube. It is always dropped from the same height and with the same force, and the degree of its bounce indicates the exact hardness of the steel.

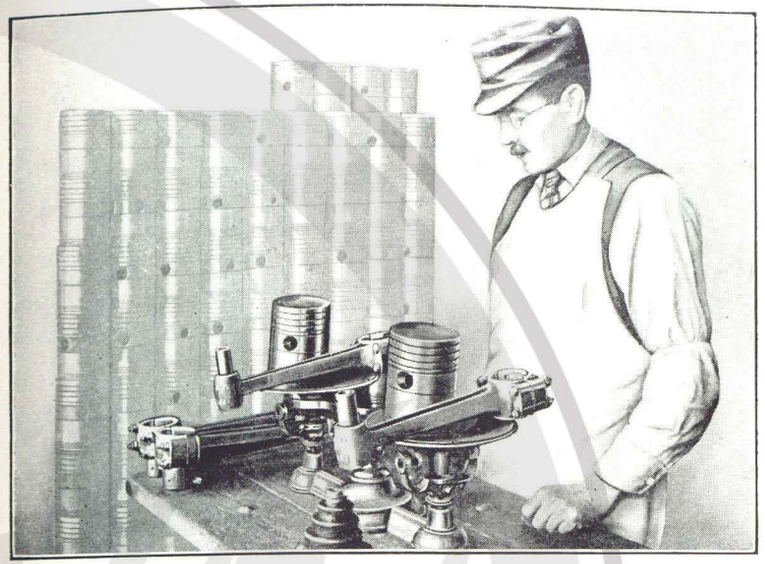
The scleroscope is the most scientific means of testing metals. All steel which goes into a Chalmers car is submitted to this rigid trial to determine that it is heat treated to give the best wear.



Testing the 'wrist-pin" of a Chalmers piston by means of the scleroscope, the most scientific instrument for testing the hardness of steel. Chalmers parts can be neither too soft nor too hard.



In the inspection of Chalmers cars and Chalmers parts, thousands of micronometers, test gauges of different styles, and measuring devices are used. This picture shows a few of the various kinds of gauges in the office of the head inspector. All of these gauges are brought into the head inspector's office each night, and between the closing of the factory in the afternoon and its opening the next morning all are carefully tested to make sure that the gauges themselves are perfectly accurate.



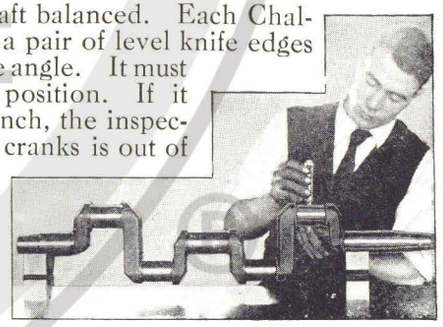
This picture shows the balancing of one Chalmers piston assembly against another. This is an actual picture from the motor department of the Chalmers factory.

The Scale of Perfection

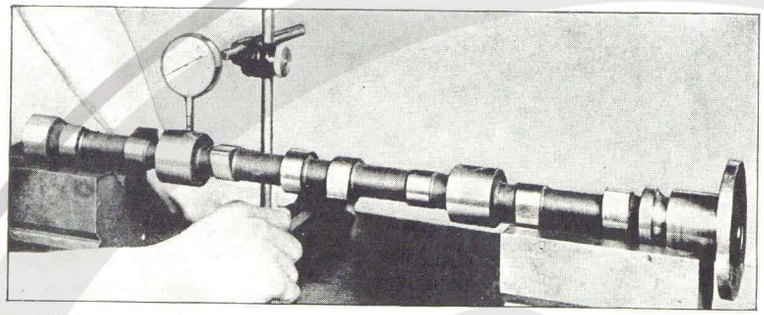
TO insure long wear and smooth action in an automobile motor, every part must be perfectly balanced.

In the Chalmers factory the motor parts are actually weighed on scales. Piston is balanced against piston; connecting rod against connecting rod. The complete piston assembly for each cylinder of a Chalmers car weighs the same as every other piston assembly in that car, with less than one-quarter of an ounce variation. This perfect balance is a feature of the Chalmers inspection system, which means quietness, smooth operation, even power and long life to the motor.

So, too, is the crank shaft balanced. Each Chalmers crank shaft is laid on a pair of level knife edges and turned at every possible angle. It must remain stationary in any position. If it moves the fraction of an inch, the inspector knows that one of the cranks is out of balance, and that crank shaft is rejected. Each bearing surface is also tested to an accuracy of 1-1000 part of an inch, for every precaution is taken to secure a perfectly balanced motor.



Not only is the Chalmers crank shaft perfectly balanced, but each dimension is tested for an accuracy of 1-1000 part of an inch.



Each Chalmers cam shaft is submitted to several different tests. The cams themselves, the bearing surfaces, the length, are all accurate to 1-1000 part of an inch.

The Smallest Thing You Ever Saw

A micrometer is capable of measuring as fine as 1-10,000 part of an inch. The micrometer test is used on every moving part of a Chalmers car The picture shows the micrometer test of a wrist-pin from a Chalmers piston.

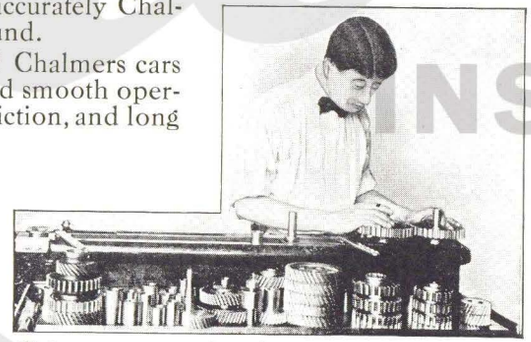
ACCURATE fit is the most essential thing in the building of a smooth-running, durable motor car.

The smallest thing you ever saw is a ponderous mass when compared with the variation allowed in some of the parts which go into Chalmers cars. One one-thousandth part of an inch is the allowance on most of the working parts. One-half of 1-1000 part of an inch is the allowance on gears.

Can you imagine one-half of 1-1000 of an inch? Take your desk ruler and figure it out. Divide the little 1-16-inch space by 125. That is how accurately Chalmers gears are ground.

To the owners of Chalmers cars this means quiet and smooth operation; absence of friction, and long life for the car.

No cars at any price are manufactured with greater accuracy than the Chalmers. Almost no other medium-priced car is tested so rigidly as the Chalmers.



As Chalmers gears come from the cutting department they are tested for gear interference. A variation of only 1-1000 part of an inch is allowed in the measurement of each tooth. When finally ground and ready to go into a Chalmers car, these gears are accurate to one-half of 1-1000 of an inch.

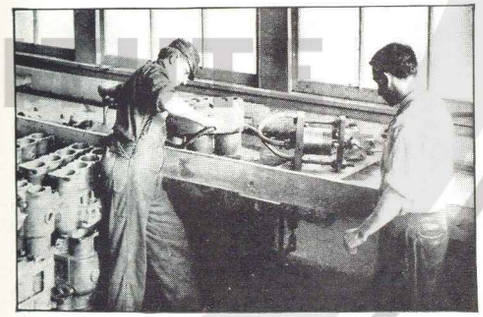
Each Chalmers radiator and gasoline tank is first filled with air under pressure and then submerged in water. One bubble rising to the surface means the rejection of the part under test.

The Trial by Immersion

AIR under pressure can be confined only in a vessel which is absolutely air-tight. Air is the hardest of all natural elements to confine. Any receptacle which will hold air under pressure will hold water or gas or oil.

And so each Chalmers radiator, each gasoline tank, each air-pressure tank for the self-starting system is given the test of immersion. Each is filled with air under pressure and all of the regular openings are plugged. Submersion in water then shows if there is perchance any leakage.

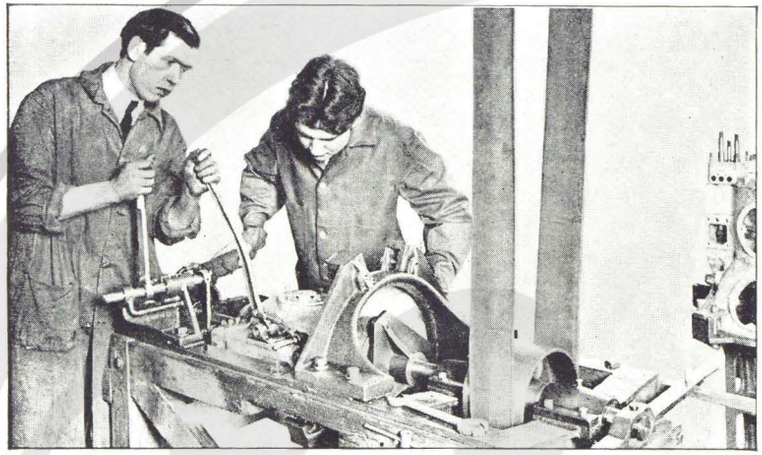
Cylinder water jackets, all water connections, and even pistons, are also tested with water under high pressure. The water jacket is filled, with all openings plugged, so that any leak is readily seen. In this way the Chalmers Company assures itself that all fluid retaining parts are perfect and will perform their functions properly.



If water under high pressure will not leak from the water jacket of the cylinder, water under normal circulation when the motor is running will not leak. This is the test to which the various parts of a Chalmers motor are submitted.

This inspection is a guaranty against cylinder, piston or radiator leaks. A score of men are employed exclusively in submitting these various parts of a Chalmers car to the water test. And when they put their O K. on any part, it is perfectly air or water tight.

One bubble or one drop of water leaking through means rejection.



A Chalmers transmission in the block test. The men who inspect Chalmers transmissions do nothing else. They are so expert in this work that the least variation of sound, indistinguishable to the layman, tells them a story of perfect or imperfect gear action.

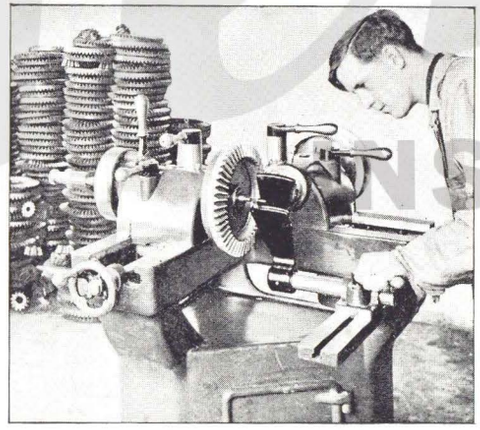
The Supersensitive Ear

IT is not enough for the Chalmers Company that the transmission gears that go into Chalmers cars are ground to an accuracy of one-half of 1-1000 of an inch. When these gears are made and have passed the first rigid inspection, they are given actual work-outs before they are assembled in a car.

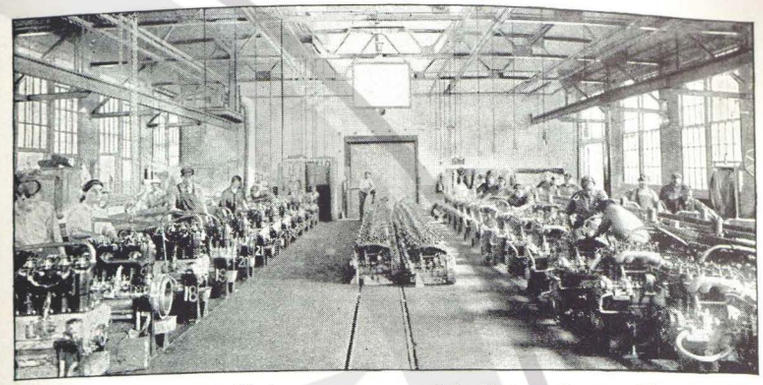
In the transmission test the completed transmission is driven at varying speeds. Each gear is shifted rapidly and slowly.

In the same way the driving gears for the rear axle are actually worked out. A machine tests for what is known as "gear interference" to an accuracy of 1-1000 part of an inch. After the test, each gear and mated pinion are wired together, so that only perfect gear sets go into the finished axle.

As a result of this careful testing, not even the highest priced cars have quieter axles or transmissions than the Chalmers.



This machine for testing driving gears and pinions for gear interference is the newest and most scientific device built. It has a micrometer gauge which shows to an infinitesimal degree the amount of friction between the teeth of the gears.



This is a general view of the block motor test room of the Chalmers factory. No automobile motors receive more thorough or more scientific tests than do the Chalmers motors tested out in this department.

A Modern Sisyphus

BACK in the mythological days, Sisyphus offended the powers on Mount Olympus. To correct the error of his ways, Sisyphus was condemned to roll for all eternity a great stone up an unending hill.

The modern Sisyphus is the Chalmers block motor test. Here the completely assembled motors are made day after day to carry loads equivalent to a fully equipped touring car with its full capacity of passengers.

The block motor test department of the Chalmers factory is without a superior in the industry. In the special building devoted to this work, 52 motors may be tested at one time.

Each Chalmers motor is run on its own power for ten hours at speeds varying from 800 to 1400 revolutions per minute. And during this long grind, each motor carries its full load.

And finally, when the inspectors are satisfied that the motor is running perfectly, it is put on a dynamometer and made to develop its full rated horse-power.

This is a true test of trial. Nothing is left to doubt. Accurate measurements alone are not enough. Only this rigid test of the completed motor satisfies the Chalmers method of inspection.

After assembling, Chalmers axles are tested under load in a chassis.

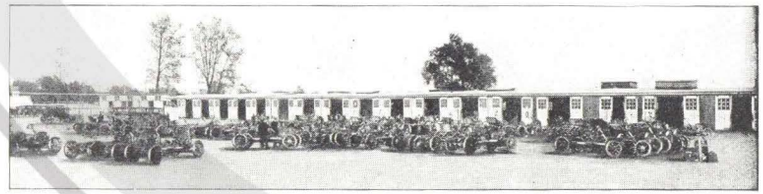
Each Chalmers chassis is tested in the "stripped" form. To compensate for the difference in weight, heavy cast iron ingots are carried in the rear of the chassis. The picture shows a Chalmers "Six" in the road test.

The Proof of the Pudding

CHASSIS testing has bred a new kind of man—one with the courage to drive a motor car at high speed over all kinds of roads; with the mechanical skill to discover any defect in a car; with an ear so finely trained that by sound he can distinguish any defect of construction.

The men who put Chalmers chasses through their paces know every noise that a motor car makes. They pound the Chalmers chasses over rough country roads in rain or shine and put them through a course of sprouts that proves every part. Any sound that is not right and indicative of a perfect working motor or axle or transmission or clutch, tells of an adjustment needed. When the Chalmers chassis receives the O. K. of the chief inspector, it is mechanically right and every working part has been thoroughly tested and checked off on a long sheet. If the test of any part is not recorded on the inspector's sheet, the chassis is not accepted for finishing.

Some medium priced cars are marketed with little or no road test; yet the road test is one of the most important operations in the building of a car. It means to the owner that his car works smoothly and without friction. It means the thorough working-in of every part. It means satisfaction.



The row of buildings shown in the picture is known in the Chalmers factory as the "rough test" department. Here all of the chasses going through the road test are adjusted. Here each chassis is checked over. These buildings are rightly named; it is a rough test through which each chassis is put to prove whether or not it be worthy to be called a Chalmers car.

In the final inspection yard at the Chalmers factory, all finished cars are given their last try outs before going to the shipping department.

The Final Reckoning

AND when a Chalmers car is at last ready for shipment, when it has been fully equipped and tagged for transportation, it is submitted to an inspection more rigid than all of the others.

The man who inspects a completed Chalmers car for the last time carries a list of requirements up to which a car must measure in every detail. From radiator spout to tail light, the finished car is gone over carefully. Even a scratch on the body, a loose nut, or a door that does not latch properly, means the rejection of that car. It must be perfect before the shipping department will accept it.

Every car that passes this final inspection is turned over to the shipping department ready for work.

All Chalmers cars are shipped from the Chalmers plant. They are packed in freight cars and for foreign shipment by Chalmers men. When a purchaser receives his Chalmers car, it is ready for the road.

The picture at the left shows a shipment of cars for Australia. All cars for foreign shipment are boxed as shown in the picture.
The second picture shows one of the Chalmers shipping docks filled with cars destined for all parts of the United States. Chalmers cars are used the world over.

The service corps of the Chalmers Company. If you own a Chalmers car, you can always get information, advice and willing assistance from the Company's technical department.

The Satisfaction Factory

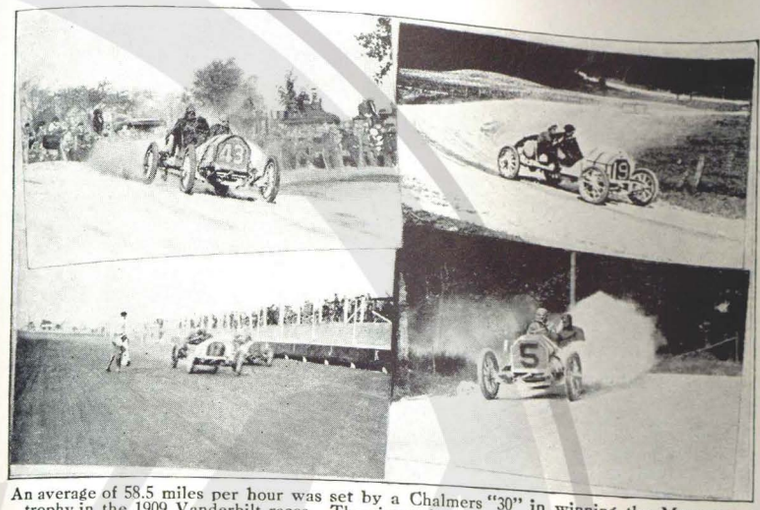
CHALMERS cars are built to give service. In this book, Chalmers manufacturing and inspection methods have been outlined.

But building Chalmers cars rightly of the right materials, does not satisfy the Chalmers Company. The sale of a Chalmers car does not end with the acceptance of the purchaser's money. The Chalmers Company stands behind its cars after they are sold.

The factory service division is one of the largest and most important departments in the Chalmers organization. Here are kept in stock a half-million dollars worth of parts of all Chalmers models. Most of this stock will never be used. It is kept as a guarantee of efficient service to Chalmers owners.

The Company also maintains in Kansas City and San Francisco, extensive stock depots. By this system, it is possible to make needed replacements with the least possible delay.

We believe that the service rendered Chalmers owners by the Chalmers Company and Chalmers dealers is not surpassed by any company.



An average of 58.5 miles per hour was set by a Chalmers "30" in winning the Massapequa trophy in the 1909 Vanderbilt races. The picture in the upper left corner shows Chalmers No. 43 making the Westbury turn and establishing this world's record for light cars. The picture at the right shows Chalmers "30" on the famous "S" turn, winning the Indiana trophy in the longest and hardest light car race ever held in America. At the lower left are shown two Chalmers "30s" finishing one and two in the 100-mile Candler trophy race, Atlanta Speedway. The fourth picture shows a "30" winning the Merrimac Valley race.

Does Such a Car Make Good?

PROOF that Chalmers cars do make good is found in this fact—that 27,000 of them are today giving satisfactory service in owners' hands.

Nothing we could say would be stronger. Think of it—twenty-seven thousand Chalmers cars—each one bought, after investigation, by a man who has been convinced that a Chalmers offered the greatest value for the money. Think where these cars are scattered; the different kinds of country they are used in, the different kinds of people who drive them.

And remember these cars *have made good*. The *first* ones made good and the next ones, and the next ones. That's why we have been able to sell 27,000. Because people who have tried them say to other people "Chalmers cars are good cars."

We have also put our cars to the proof in contests—and no others have ever made such a showing. In two years of contests on road, track and hill, Chalmers stock cars won 92 firsts, 32 seconds and 21 thirds.

Victory in the 1910 Glidden Tour, longest and hardest of motor contests; 208 miles a day for 100 consecutive days; win-

The Chalmers "30" winning in its class at the Algonquin hill climb.

ning of the Indiana Trophy; speed records on a score of tracks; consistency prizes at Fairmount Park and elsewhere; endurance trophies—all prove the superior stamina of the Chalmers.

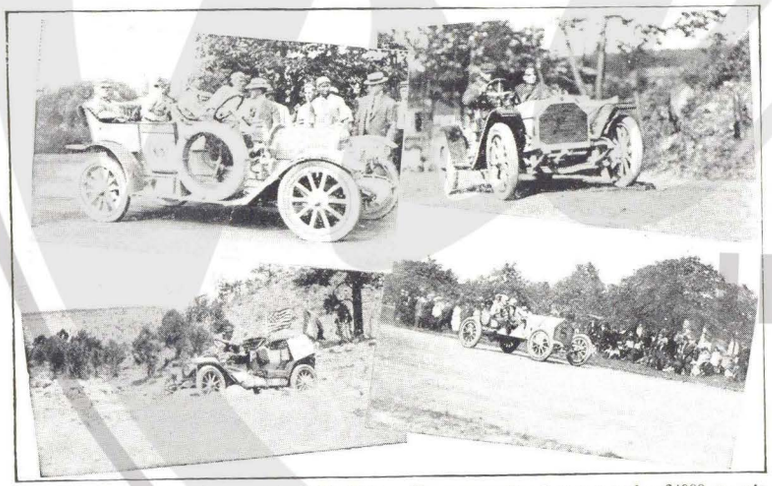
But greater than all is the following record, made not by trained drivers but by everyday owners:

Fifteen Chalmers cars with a total mileage of 1,061,056. And these cars are still running.

Owner	Town	Model	Mileage
Fred Roberts	Corpus Christi, Texas	1909	80,000
Frank W. Fiske, Jr.	Buffalo, N. Y.	1907	54,752
G. B. Gillen, Crane Co.	Baltimore	1909	45,503
F. H. Brunig, M. D.	Kansas City	1907	50,000
A. D. Williams	Kansas City	1908	100,000
Harrison Johnston	Kansas City	1909	47,000
Chalmers Motor Co., "Old Reliable"	Detroit	1909	73,117
W. H. Caffery	Kansas City	1908	125,000
P. May	Kingsley, Ia.	1909	50,000
E. Watson Gardiner	Amsterdam, N. Y.	1908	78,684
W. D. Silliman	El Dorado, Texas	1910	63,000
Dr. G. S. Newson	Athena, Ore.	1909	60,000
R. L. Holt	Burlington, N. C.	1909	120,000
W. C. Kramer	Joplin, Mo.	1908	75,000
Dr. R. M. Patterson	Detroit	1908	41,000
Total—15 Cars	9 States	....	1,061,056

Here is not merely one car which has held together for 100,000 miles, but fifteen cars which have totaled over one million miles. In the files at the factory are the reports of many other Chalmers cars with records of 15,000 to 35,000 miles—and there are undoubtedly others of which we know nothing, with records of 40,000 to 75,000 miles.

Such a record as this is the greatest tribute ever paid to the endurance of a car. Isn't this the kind of a motor car you want?



Chalmers "30" No. 5, winner of the 1910 Glidden Tour, was the first car under $4000 to win this classic contest. The picture at the upper left shows No 5 finishing at Chicago.
The Chalmers "Forty" shown at the right won three firsts, one second and two thirds on Dead Horse Hill, Worcester, Massachusetts.
"Old Reliable," the first Chalmers "30" built, is shown in the lower left picture during the blazing of the trail from Denver to Mexico City.
In the lower right corner, Chalmers "Forty" winning the Consistency Prize in the 200-mile Fairmount Park race, Philadelphia. This car went through the race without a single stop.

CHALMERS · MOTOR · CO.
Detroit, Mich., U.S.A.

This monogram on the radiator stands for all you can ask in a motor car

THIS is the Chalmers trade-mark.

A trade-mark is like a coat of arms. It is the sign and seal of rank and quality. It stands for the character of the house that uses it. It stands for the reputation of the goods that bear it.

Thus a little dog has come to stand for the best in musical machines; a bell for the most efficient telephone service; an anchor and a lion for recognized excellence

in silverware; a single name for the finest quality in jewelry.

These trade-marks stand for all you have learned to know about the goods they represent.

Among automobiles the Chalmers monogram—our trade-mark—has come to stand for certain things in the way of motor quality—for the highest dollar-for-dollar value it is possible to put into a car.

The wording that appears under this monogram is not just a catch phrase; it is a well considered statement of a reliable company—a company that has earned a reputation for honest motor car building.

We know that this monogram really does stand for all anyone can ask in an automobile. What more could one desire in a car than you get in a Chalmers?

It has all the power you want; all the speed. It has the comfort; convenience; good looks. It is reliable; guaranteed; and it is backed by a great organization. These are the things you demand in the car you will buy. These things the Chalmers cars possess—and people know it.

That is why the Chalmers monogram has come to mean so much. It stands for all we have told you about in this book. It stands for the good designing; for the good materials; for the manufacturing methods; for the $6,000,000 we have invested in the business; for testing; for inspection; for service. It stands for everything that the Chalmers Company is.

It is the stamp of genuiness on our product.

Chalmers Cars for 1913

"30"	$1600	"Six"	$2400
"Thirty-Six"	$1950	"Six" 7-passenger	$2600

FOR the season of 1913, we have put our best efforts into improving Chalmers cars along the lines of comfort, convenience and beauty.

For it is along these lines that we believe the greatest motor car improvements of the future will be made.

Mechanically, Chalmers cars have been right from the beginning. The many victories they have won on road, track and hill, and the service they are giving in the hands of 27,000 owners, prove this.

The Maximum of Comfort

For 1913 Chalmers cars are fitted with Turkish cushions and 11-inch upholstery. The springs are the finest quality cushion springs made. The hair is long and soft; the leather is genuine pebble-grained. The seats of a Chalmers car are as soft as a down pillow. Not even the higest priced cars have more luxurious upholstery.

Large wheels and tires minimize road jolts. Long, flexible springs cradle the car over the sharpest bumps.

The 1913 Chalmers bodies are extremely roomy. The seats are generously wide and tilted backward so that the passenger rides in a natural and restful position.

Easy to Handle

In points of convenience, no cars excel the Chalmers. Electric lighting by the Gray & Davis system gives the last touch of luxury. This lighting equipment, which is regularly provided on the "Six" and "Thirty-Six," is used on some of the highest priced cars. No more hunting for matches, no more climbing out of the car in dust or mud. You simply turn a switch on the dash and light at will head, side or tail lamps, or all.

The Chalmers patented air-pressure starter is regular equipment on all 1913 models. The Chalmers starter made 1912 a self-starter year. A season's use of this device has proved it the simplest, safest and most reliable self-starter built. You simply push a button on the dash and away goes your motor.

On the new Chalmers dash is carried every control and indicator—such as self-starter button, electric light switch, gasoline pressure pump, speedometer, carburetor adjustment, oil sight feed, air-pressure indicator, horn bulb, ignition switch, electric light meter, and carburetor priming lever.

The gear shift and emergency brake levers placed inside the body are located in the most convenient position. The improved accelerator does not tire the foot. The clutch and brake pedals are just where they ought to be.

Continental demountable rims obviate tire troubles. With demountable rims it is possible to change tires in a few minutes. The power tire inflator, which is a part of the Chalmers self-starter, does away with laborious hand pumping.

No Cars are More Beautiful

Every detail making for the greater beauty of Chalmers cars has been given scrupulous attention. The new Chalmers bodies have the graceful

hooded dash built in one piece with the body, and the handsome bell-shaped back. The sides are flush, with concealed door locks. The all-metal construction does away with high moldings and sharp angles. The top of the hood and the body form a single straight line from radiator to rear seat.

Each Chalmers body receives 21 coats of paint and rubbing varnish. The colors are rich and durable.

Handsome nickel trimmings and black enameled lamps harmonize with the general equipment of the car and add to the effect of perfect unity. The fenders are long and gracefully curved. Running boards and front floor boards are carpeted with gray cork linoleum. The entire body is leather lined, adding not only to the beauty of the car, but leaving nothing to mar or scratch.

Three chassis models are offered for 1913—the "Six," the "Thirty-Six" and the "30."

The Chalmers "Six" at $2400 is a maximum car. The powerful long-stroke motor, rated at 54 horse-power, actually develops 60 to 70 horse-power. The 130-inch wheel base and 36" x 4½" tires insure the greatest riding ease. The four-forward speed transmission gives the greatest flexibility.

On the six-cylinder chassis, six body types are offered—5-passenger Touring Car, 4-passenger Torpedo, 7-passenger Touring Car, 2-passenger Roadster, 4-passenger Coupe, and 7-passenger Limousine.

The Chalmers "Thirty-Six," first introduced a year ago, won its way to popularity by sheer merit. This was the first medium-priced car having all the features of the highest priced cars, and in addition many exclusive Chalmers features. For 1913 the "Thirty-Six" has been further improved and refined.

With the Chalmers long-stroke motor—4¼-inch bore x 5¼-inch stroke—four-forward speed transmission, 118" wheel base, self-starter, demountable rims, 36" x 4" tires, and electric lights, this popular four-cylinder model is an ideal all-around car.

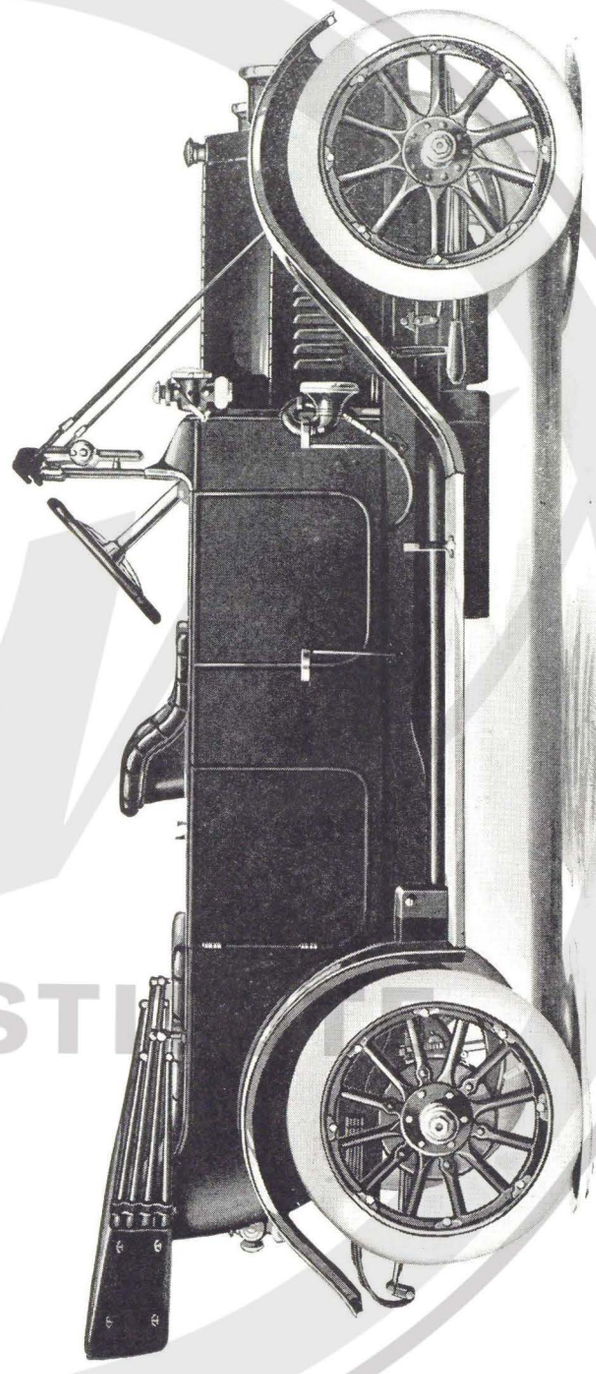
The body types provided on the "Thirty-Six" chassis include 5-passenger Touring Car, 4-passenger Torpedo, 7-passenger Touring Car, 2-passenger Roadster, 4-passenger Coupe, and 7-passenger Limousine.

The always popular Chalmers "30" offers even greater dollar for dollar value for 1913. The "30" was the first real automobile offered at a medium price. Each year has seen it made more comfortable, more convenient, and better to look at—without increase in price. It has been refined and improved mechanically. For 1913 the "30" is equipped with Chalmers self-starter and demountable rims, in addition to many other improvements.

Two body types are offered—5-passenger Touring Car and 4-passenger Torpedo.

Brief Specifications

	"Six"	"Thirty-Six"	"30"
Wheel Base	130 inches	118 inches	115 inches
Horse-power	54 h. p.	36 h. p.	30 h. p.
Bore	4¼ inches	4¼ inches	4 inches
Stroke	5¼ inches	5¼ inches	4½ inches
Cylinders	Six	Four	Four
Transmission	Selective sliding; four speeds forward and reverse	Selective sliding; four speeds forward and reverse	Selective sliding; three speeds forward and reverse
Brakes	Two sets, contracting and expanding; both on rear hubs	Two sets, contracting and expanding; both on rear hubs	Two sets, contracting and expanding; both on rear hubs
Rear Axle	Full floating; Chalmers type	Full floating; Chalmers type	Full floating; Chalmers type
Wheels and Tires	36 x 4½ inches	36 x 4 inches	34 x 4 inches
Price and Type	Torpedo, 5-passenger Touring Car and Roadster, $2400; 7-passenger Touring Car, $2600; Coupe, $2700; Limousine, $3700	5-passenger Touring Car, Torpedo and Roadster, $1950; 7-passenger Touring Car, $2150; Coupe, $2250; Limousine, $3250	5-passenger Touring Car, and 4-passenger Torpedo, $1600

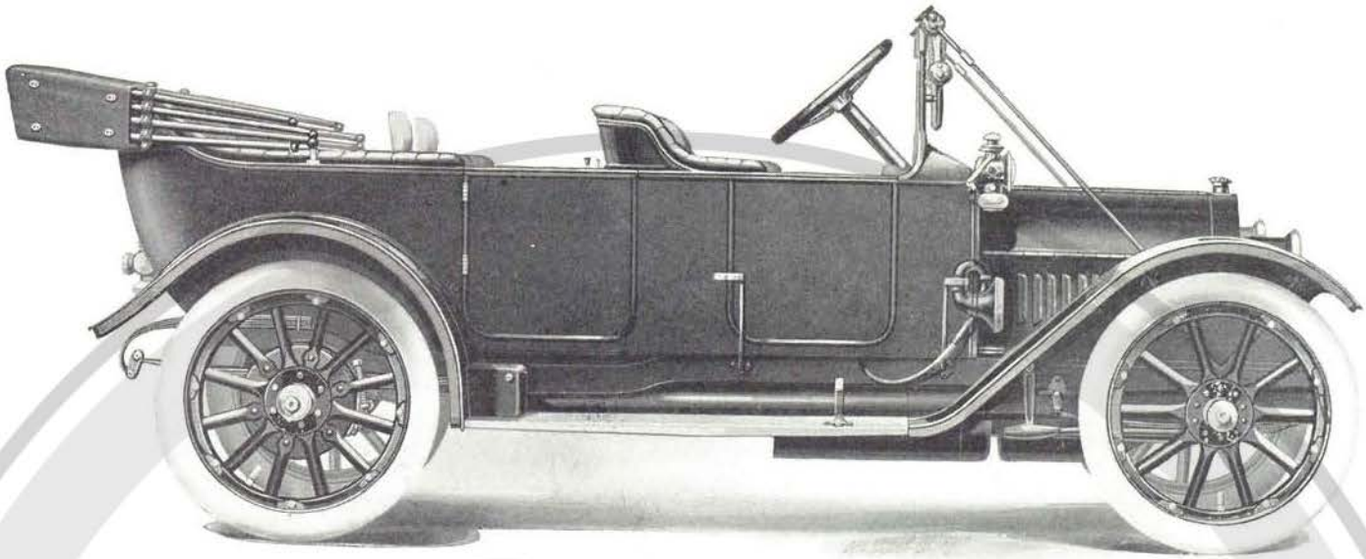


Chalmers "Thirty-Six"

Five-Passenger Touring Car, $1950

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5¼-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mats; robe and foot rails; power tire inflater; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Chalmers seat covers, $60. Trunk rack, $10.

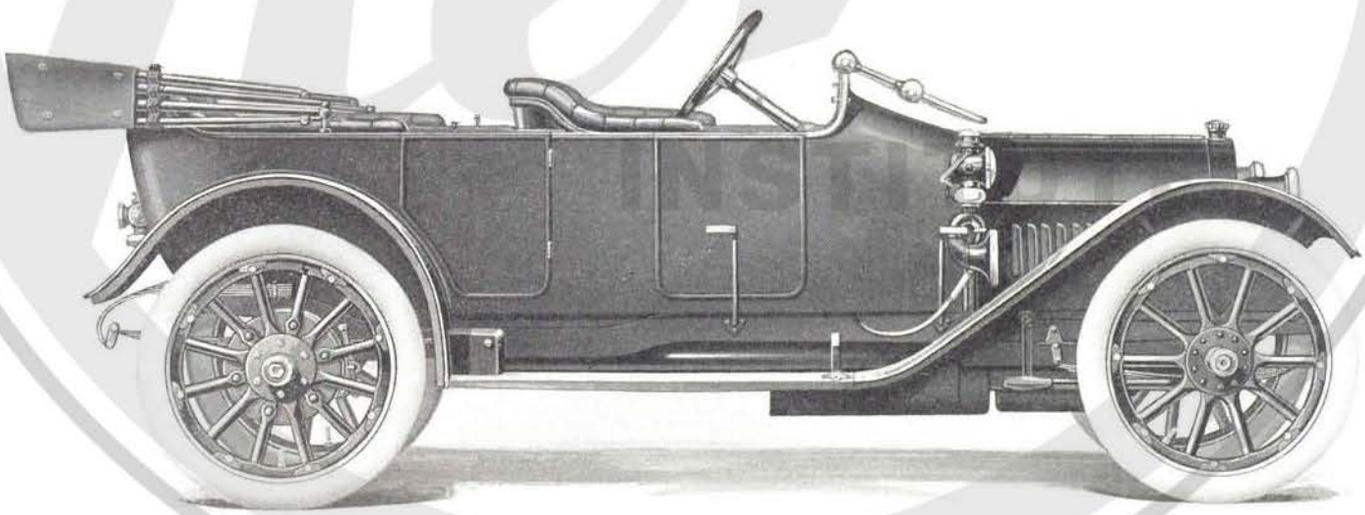


Chalmers "Thirty-Six"

Seven-Passenger Touring Car, $2150

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4½-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5½-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mats; robe and foot rails; power tire inflater; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Chalmers seat covers, $60. Trunk rack, $10.

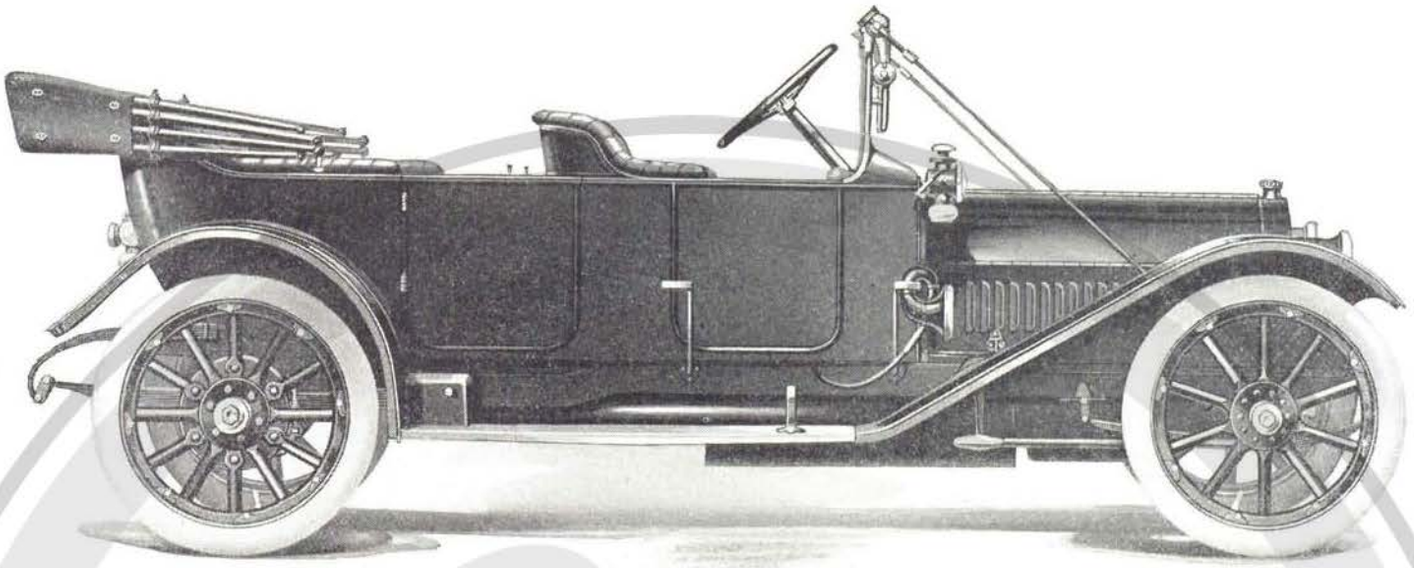


Chalmers "Thirty-Six"

Four-Passenger Torpedo, $1950

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5½-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mats; robe and foot rails; power tire inflater; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Chalmers seat covers, $60. Trunk rack, $10.

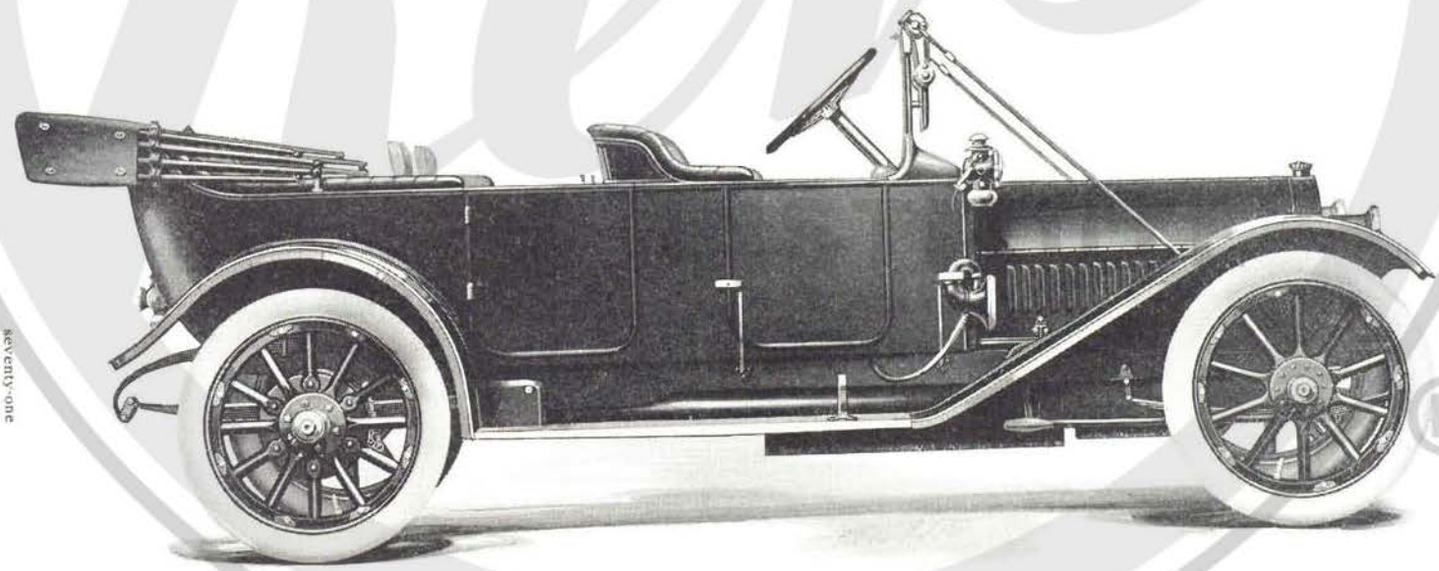


Chalmers "Six"

Five-Passenger Touring Car, $2400

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4½-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5¼-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mats; robe and foot rails; power tire inflater; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Chalmers seat covers, $60. Trunk rack, $10.

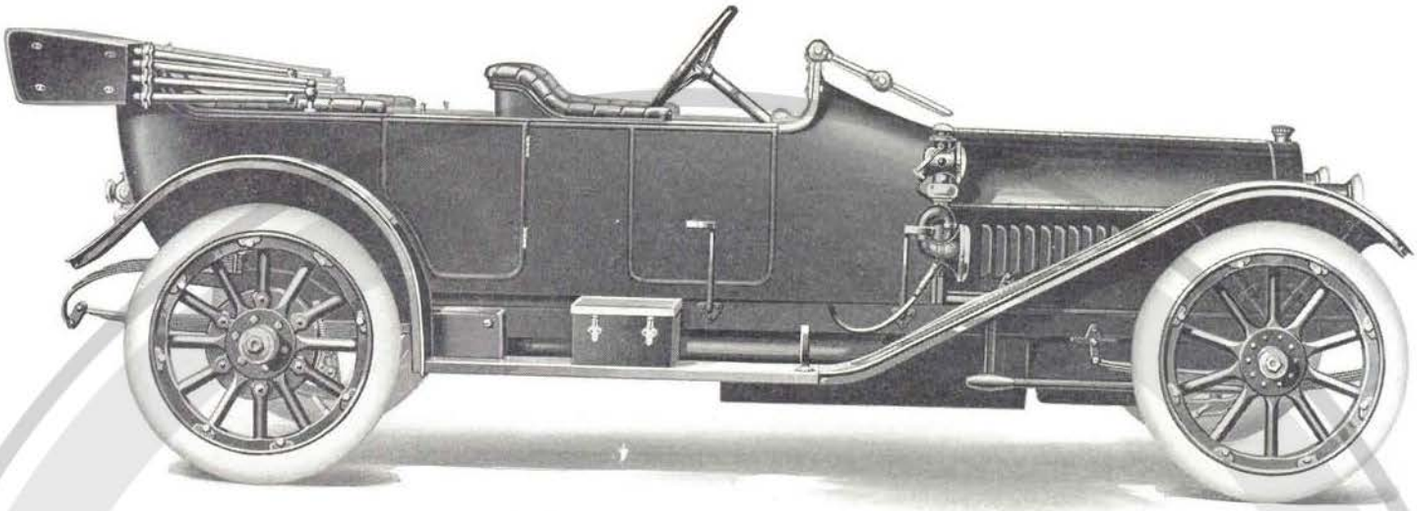


Chalmers "Six"

Seven Passenger Touring Car, $2600

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4½-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5¼-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mats; robe and foot rails; power tire inflater; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Chalmers seat covers, $60. Trunk rack, $10.

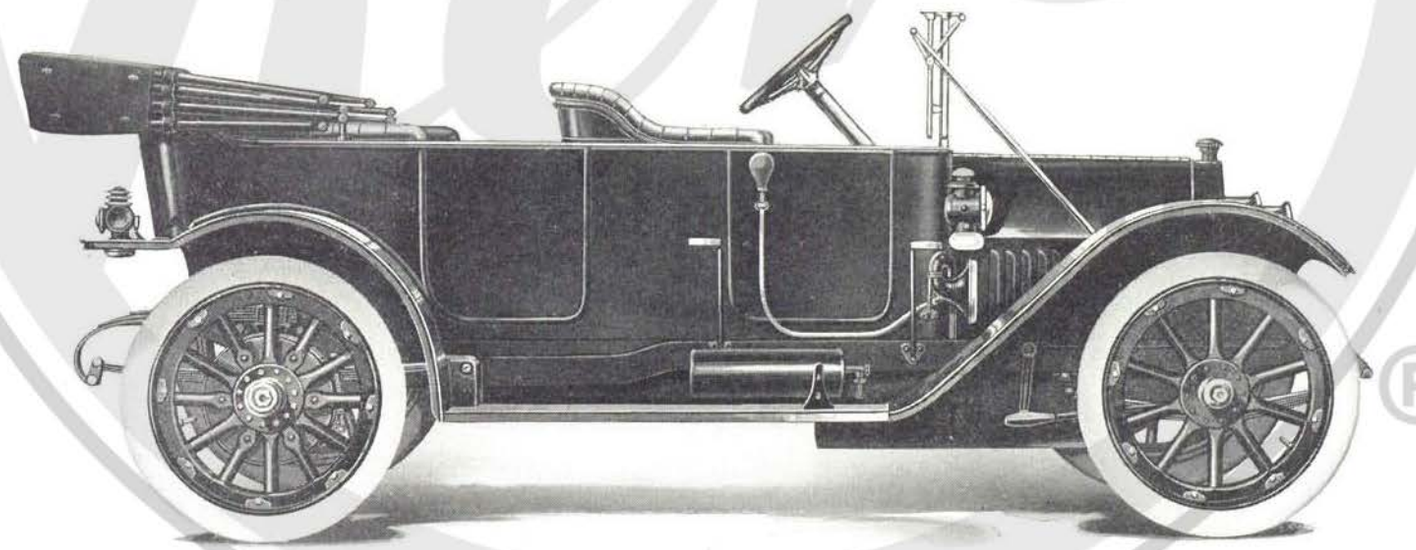


Chalmers "Six"

Four-Passenger Torpedo, $2400

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4½-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5½-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mats; robe and foot rails; power tire inflater; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Chalmers seat covers, $60. Trunk rack, $10.

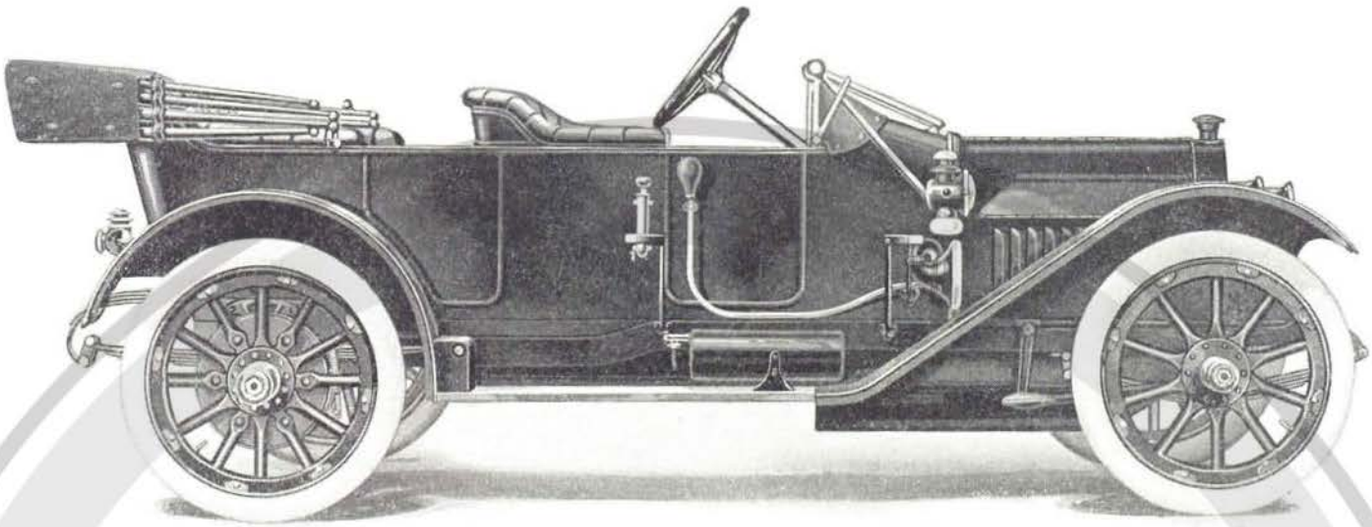


Chalmers "30"

Five-Passenger Touring Car, $1600

Regular Equipment:—Chalmers patented self-starter; Chalmers top and automatic windshield; Solar gas and oil lamps; Prest-O-Lite tank; 34-inch by 4-inch tires; five demountable rims; extra tire irons; power tire inflater; floor mats; robe and foot rails; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Stewart speedometer, $25. Chalmers seat covers, $60. Combination oil and electric side and tail lamps, and gas headlight igniter, $25. Trunk rack, $10.

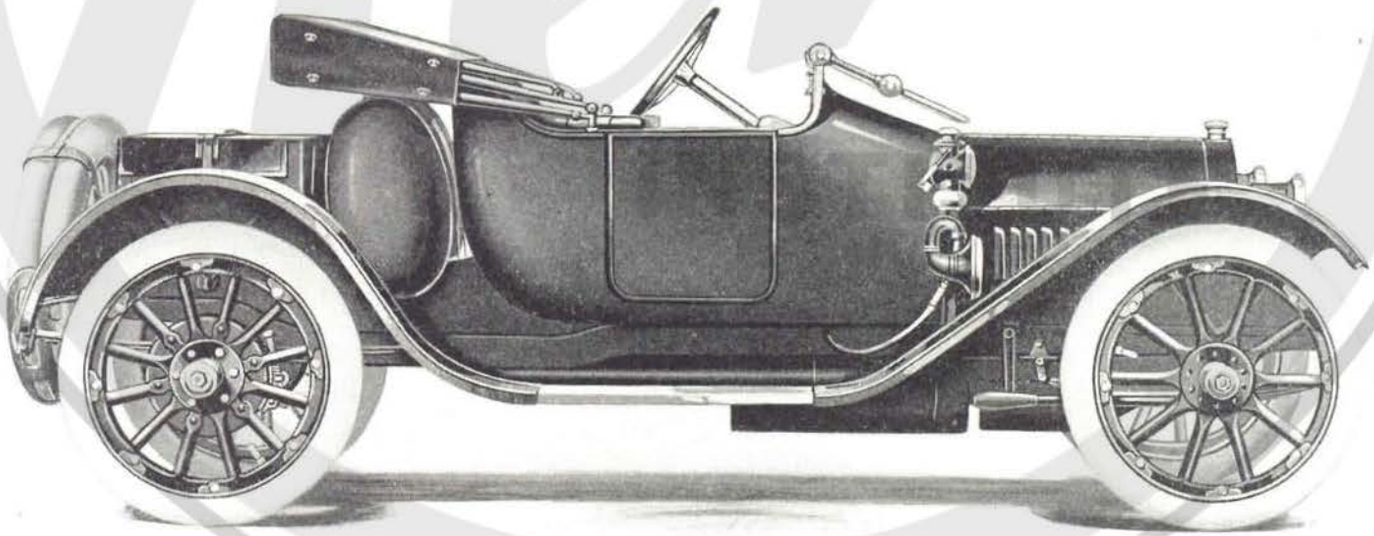


Chalmers "30"

Four Passenger Torpedo, $1600

Regular Equipment:—Chalmers patented self-starter; Chalmers top and automatic windshield; Solar gas and oil lamps; Prest-O-Lite tank; 34-inch by 4-inch tires; five demountable rims; extra tire irons; power tire inflater; floor mats; robe and foot rails; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment:—Stewart speedometer, $25. Chalmers seat covers, $60. Combination oil and electric side and tail lamps, and gas headlight igniter, $25. Trunk rack, $10.

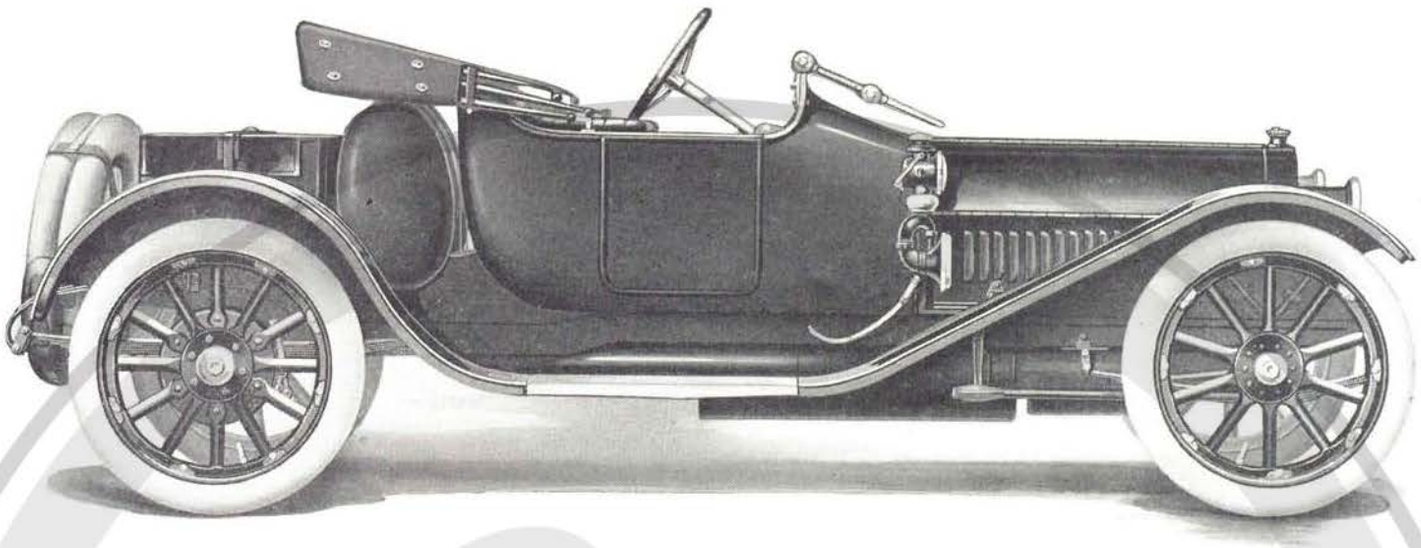


Chalmers "Thirty-Six"

Two-Passenger Roadster, $1950

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor; 4½-inch bore, 5¼-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mat; power tire inflater; 35-gallon gasoline tank; traveling trunk on rear deck; full set of tools; horn, pump, jack and tire repair outfit.

Extra Equipment.—Chalmers seat covers, $35.

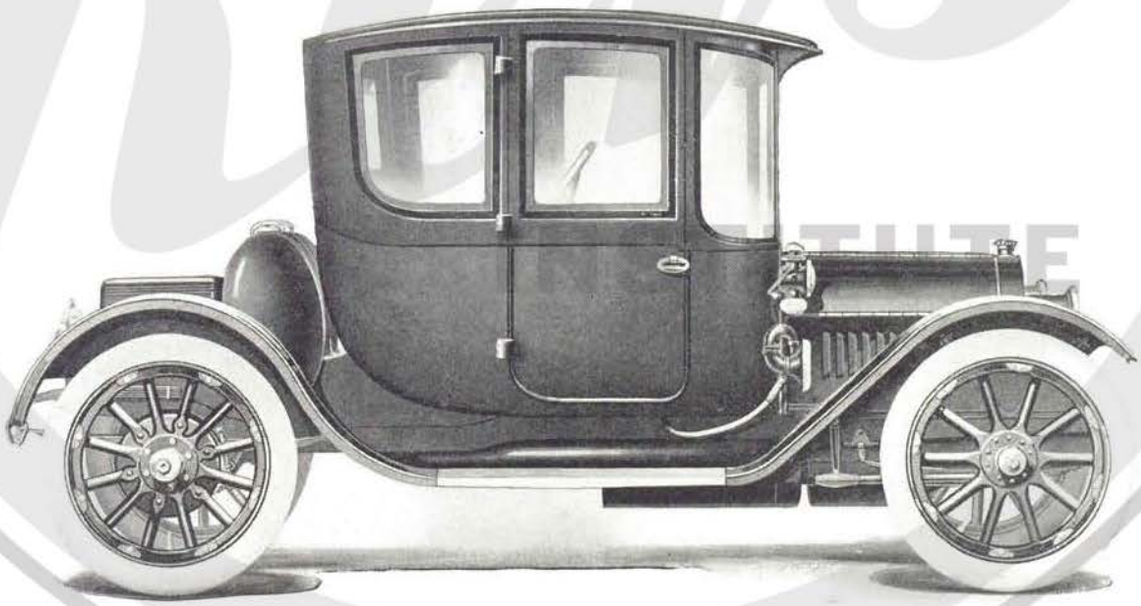


Chalmers "Six"

Two-Passenger Roadster, $2400

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; Chalmers top and automatic rain vision windshield; dual ignition; 36-inch by 4½-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5¼-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; extra tire irons; floor mat; power tire inflater; 35-gallon gasoline tank; traveling trunk on rear deck; full set of tools; horn, pump, jack and tire repair outfit.

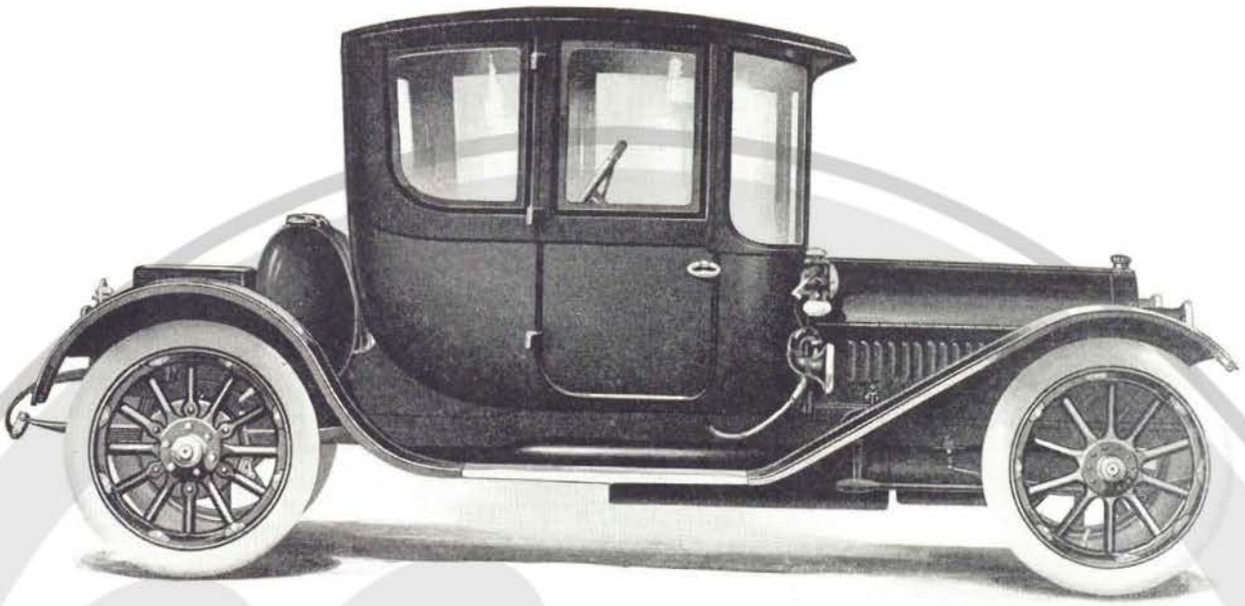
Extra Equipment:—Chalmers seat covers, $35.



Chalmers "Thirty-Six"

Three or Four-Passenger Coupe, $2250

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; dual ignition; 36-inch by 4-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5¼-inch stroke; jeweled magnetic Stewart speedometer; extra tire irons; 35-gallon gasoline tank; luggage box on rear deck; dome light; floor mat; full set of tools; power tire inflater; horn, pump, jack and tire repair outfit. Interior finish, blue-black leather.



Chalmers "Six"

Three or Four-Passenger Coupe, $2700

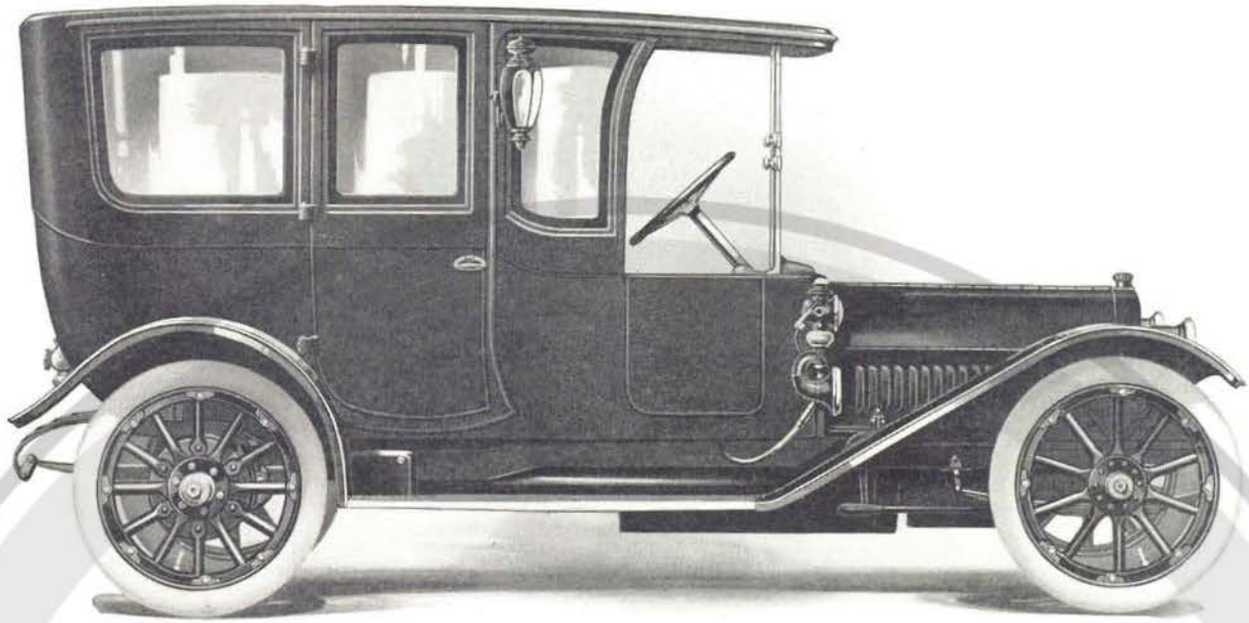
Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; dual ignition; 36-inch by 4½-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5½-inch stroke; jeweled magnetic Stewart speedometer; extra tire irons; 35-gallon gasoline tank; luggage box on rear deck; dome light; floor mat; full set of tools; power tire inflater; horn, pump, jack and tire repair outfit. Interior finish, blue-black leather.

Chalmers "Thirty-Six"

Seven-Passenger Limousine, $3250

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; dual ignition; 37-inch by 4½-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5½-inch stroke; jeweled magnetic Stewart speedometer; ventilated fore-doors; built-in windshield; imported toilet case; pillar and dome lights; extra tire irons; power tire inflater; floor mats; robe and foot rails; full set of tools; horn, pump, jack and tire repair outfit. Interior finish, option of brocade or whipcord.

Extra Equipment:—Trunk rack, $10.



Chalmers "Six"

Seven-Passenger Limousine, $3700

Regular Equipment:—Chalmers patented self-starter; Gray & Davis electric lighting system with combination oil and electric side and tail lamps; Turkish cushions and 11-inch upholstery; dual ignition; 37-inch by 5-inch tires; five Continental demountable rims; four-forward speed transmission; long stroke motor, 4¼-inch bore, 5½-inch stroke; jeweled magnetic Stewart speedometer; ventilated foredoors; built-in windshield; imported toilet case; pillar and dome lights; extra tire irons; power tire inflater; floor mats; robe and foot rails; full set of tools; horn, pump, jack and tire repair outfit. Interior finish, option of brocade or whipcord.

Extra Equipment:—Trunk rack, $10.